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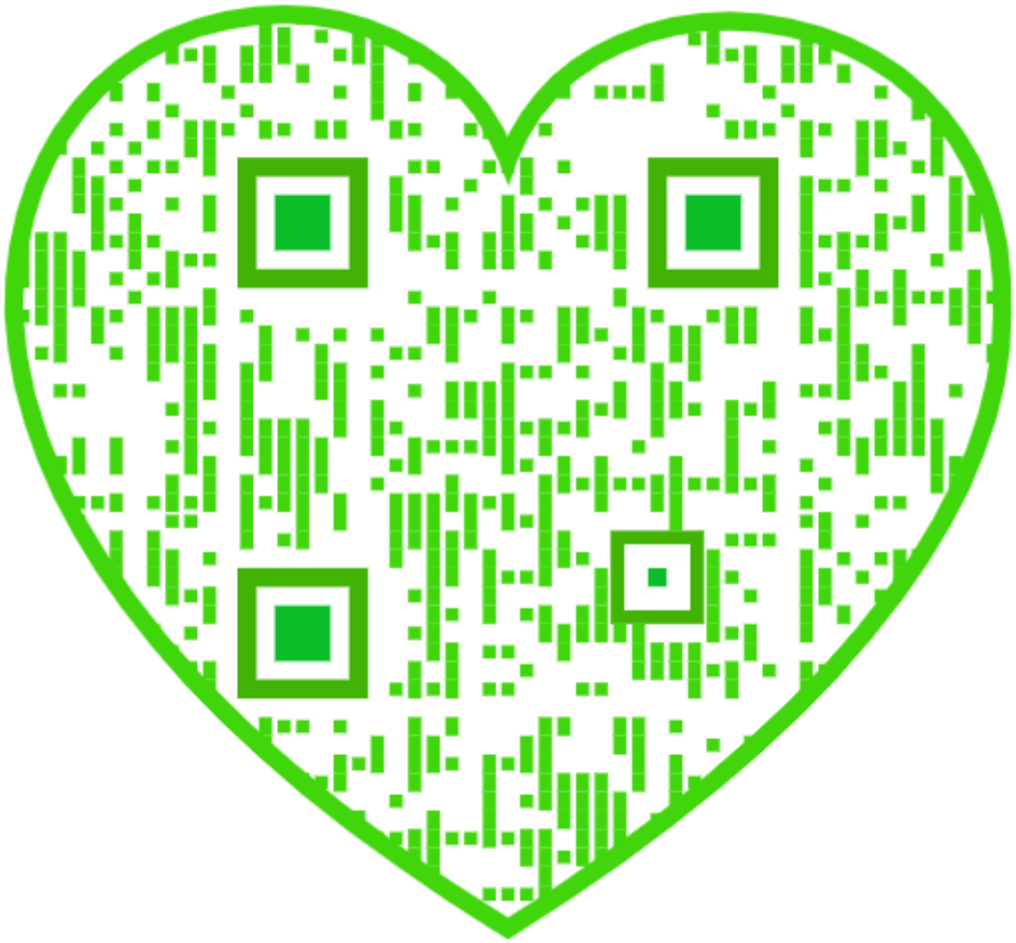

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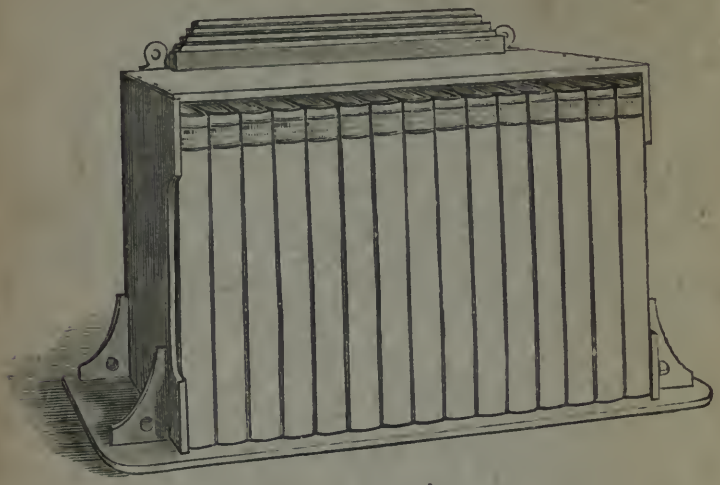

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A

MANUAL OF FRET CUTTING

AND

WOOD CARVING

BY

MAJOR-GEN. SIR THOMAS SEATON, K.C.B.

WITH DIAGRAMS.

LONDON
GEORGE ROUTLEDGE AND SONS
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A MANUAL

OF

FRET CUTTING AND WOOD CARVING.

CHAPTER I.

I AM writing for boys; for those especially who, like myself, have a taste for mechanics, and prefer turning their leisure hours to something useful, than idle about with hands in their pockets, whining, "I've got nothing to do." I have no respect for lads who complain that they have nothing to do; such fellows, nine cases out of ten, turn out worthless members of society, or get into all kinds of mischief, and become right-down scamps. But it may, and I daresay it does sometimes, happen that a sharp, intelligent, and willing lad, who could turn his hand to anything, has not the means for exercising his taste for mechanics. Then why not ask father or mother for a few shillings to buy some tools? I am sure any parent of moderate means would be delighted to see his sons take to any useful occupation that would keep them from idleness and mischief.

My father used to say that, in one respect, the Jews of

old were patterns for all fathers, inasmuch as they caused their sons to be instructed in some handicraft, so that in time of need they might have something to fall back upon, and might not "become poor and steal." St. Paul, you remember, though brought up under Gamaliel, one of the first doctors of the law, learnt also the art of tent-making, and, during one of his journeys preaching the gospel, supported himself by working at it.

Acting up to his opinion, my father allowed me to buy a handsome allowance of carpenter's tools, and all accessories, bench, etc., and took care to let me have instruction also; so that, at the age of sixteen, before I entered the army, I was a capital carpenter, and on many occasions during my career in the army in India did my knowledge of carpentry turn to good account. But as an occupation for boys generally, carpentry has several drawbacks. The first is the great expense of tools and bench, etc.; then the space required. It is not an employment that can be carried into the drawing-room, and during the winter holidays boys are or should be out all day skating, or taking some healthful, active exercise, leaving only the long evenings; so, except on rainy, dull days, they cannot practise their carpentry unless, like myself, they have the use of a good room in an out office.

Now, these drawbacks do not apply to wood carving. With very few simple tools most beautiful work can be executed, and a very great deal can be done in the drawing-room, on a working board fixed by cramps to any firm table.

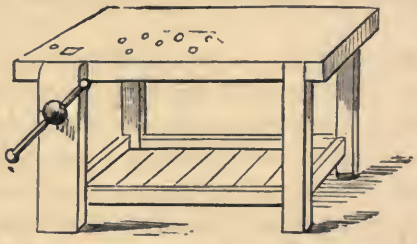
Now, let us see, first of all, what tools are required. Here is an ample list for a beginner:—Three chisels—eighth, quarter, half-inch; three flat gouges, ditto; three deeper gouges, ditto; three half-round, ditto; one V, or

parting tool; one skew, or corner chisel; one mallet; two cramps for fastening the work to the table; one oilstone; one slip; one brace and bit for boring holes; two fine gimlets; two punches (one star, the other checquer); one tracing point; one small glue-pot; a few small files, and a hammer.

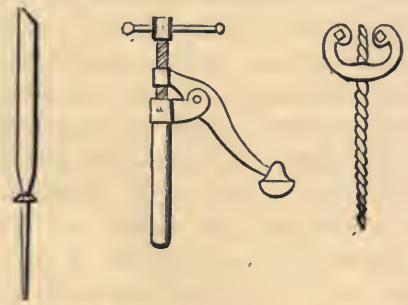
Now, all these may be purchased for about twenty-six shillings, and if father won't stand that, then some may be dispensed with. A heavy bit of wood of convenient length, with one end fitted to the hand, will supply the place of mallet; then the larger of the second and third lot of gouges may be dispensed with, and the tools may be bought two or three at a time, as the pocket-money or "tips" come in.

Now, there is one thing in respect to the purchase of tools about which I must caution you. Small, short, neatly-turned boxwood handles must be avoided; they are nearly useless. Get good-sized beech or ash handles, quite five inches long; and if the steel is four or four and a half inches long, you will have a really serviceable tool, that will do much finer and better work, and quicker than the best "ladies'" tool ever made, because the large handle gives a good firm hold. The tools, handled and ground, will cost about 9d. each; cramps, 2s. to 2s. 6d. Glue-pots according to size; you will require quite a small one. Punches are 6d. each; gimlets, 3d.; brace and bit, 2s. 6d. Oil-stones are sold by weight, Turkey-stone being the dearest, and also by far the best. Don't be persuaded to buy an Arkansas stone, they are hard and worthless; they don't "bite" sufficiently, and are fit only for slips for very fine, delicate tools. Buy a working bench by all means, if you can, it will so greatly facilitate your work. It should be at least

forty inches long by twenty-four wide, with a bench-vice at one end, and a tray on the further side to hold the tools. The thickness of the bench should be at least two inches, and as firm and solid as can be made. It should be made



high enough for you to stand up to your work, and have holes bored through at convenient distances in three rows to insert the holdfast, of which I give a sketch, or the carver's screw. This last is by far the best; it is all below the table, as I will explain further on, and there is nothing in



the way of the carver. The holdfast is put into one of the holes, the work to be held is put under the pad, and the screw is turned until the work is firmly fixed. This holdfast is used when the wood to be carved is too thin for the carver's screw to be inserted into it, and when it is not

desirable to glue it down on another board. In using this holdfast, I always put a piece of some soft wood between the pad and the wood I am carving, so as to prevent the teeth of the pad from marking it. You can understand that a deep scratch might interfere sadly with the delicate part of some leaf.

The French carvers make use of a holdfast with a fixed arm, instead of a moveable arm and screw, and it has one advantage, it is lower than the screw holdfast; the carver's arm passes more easily over it. The screw holdfast can be used in the same way by simply taking out the screw.

Should this little work be read by any amateur who has made a commencement in carving, who has the means, and wishes to buy a small set of tools, but does not quite know what to purchase, I recommend the following list of tools. He will find this an ample list, and with these tools he will be able to carve anything that is not too large:—

Gouges, very flat	8	V tools	2
„ flat	8	Graining gouges	3
„ ⅛ flat	8	Holdfast	1
„ ¼ flat	8	Corner screw	1
„ ¼ round	8	Oil-stone	1
„ hollow	8	Slips	2
Firmer chisels	6	Mallet	1
Bent chisels	8	Pricker	1
„ gouges	8	Pair of compasses	1
Skew chisels	3	Small glue-pot	1

Mr. G. Buck will supply a very nice strong bench for 28s.

The gouges and chisels of each set to commence from the smallest size. The whole may be purchased for about £4.

My bench is a compound of carver's and joiner's bench,

and I strongly recommend it to all amateurs who can afford to have one made; for after having carved your work you can joiner it, and you can plane and prepare your own wood, and be thus independent of the carpenter, which is most desirable.

My bench is of the following dimensions:—length, 4ft. 5 in.; breadth, 2 ft. 1 in.; height, 3 ft. 1½ in. The wood is oak three inches thick, and there are three rows of holes for the holdfast. There are only two holes in each row; the centre of the holes of first row three inches and a half from edge, and fourteen inches from head of bench. There is the usual bench stop, or dog, and the bench vice is of the French pattern, which I consider vastly superior to the English.

But we must get on. The first thing to do is to learn to sharpen your tools. You will get them ready ground from the tool-maker's; and, by the by, if you do not know where to get your tools, I recommend G. Buck, Tottenham Court Road, London, or Mosley & Simpson, King Street, Covent Garden; where also you will get all kinds of patterns, and prepared woods for diaper carving, fret cutting and carving, or block carving. The oil-stone must be set in a block of wood, with cover, and you must first of all see that it is quite smooth and level, with no hollows or rough places in it. If it should not be quite smooth or have hollows in it, grind it down. Get a bit of stone—flagstone or a bit of sandstone of any hard kind about three inches square, or about the size of half an orange. If it has one flat side, all the better; if not, rub it on the kitchen stone sink, or on any stone, until you get a flat surface. Then on your oil-stone put a little coarse emery; wet it well. Then take your flat bit of stone and rub it round and round, like a

painter grinding colours, keeping it constantly wet. Go all over the oil-stone regularly; it will soon be ground flat; then finish with a little fine emery. Now put a little oil on the stone; take one of your chisels, the handle in your right hand, put it on the stone, and holding it at the angle at which it has been ground, place the fingers of the left hand on the face, and with a moderate pressure rub it steadily backwards, looking at it frequently to see if you do not get it down too much, and make what is called a wire edge. Turn the chisel over and rub it on the other side; both sides of a firmer chisel must be ground, and sharpened equally on both sides. When the edge has been got down fine enough, raise the hand slightly, and give the edge on both sides a semi-circular sweep forwards once or twice. This takes off the wire edge; but if it should not, then draw the edge of the tool through the edge of a piece of wood, or stand it up on the table and give it a slight bend backwards and forwards. This will take it off, and the tool can then get one or two more rubs with the semi-circular sweep before described, and it will be finished. But I must caution my readers not to rub too hard with the forward semi-circular sweep, or raise the hand too much, as this would make a little shoulder in the bevel, which would have to be rubbed down. Sharpen your gouges in the same way, only you must continue turning your hand as you rub to and fro, so that each part of the edge of the gouge may have its share of the stone.

I sharpen my gouges in a different manner from most people. I hold the gouge across the stone, giving it a rocking motion by turns of the wrist, as I push it up and down the stone. To explain: Bring the gouge close to you, holding it across your body; put the further corner of gouge

down on the stone, push from you, and at the same time turn your wrist, so that the upper or nearest corner comes down on the stone; drawing it back reverse the motion, and in this way every part of the edge of the gouge will be ground by the stone. I have found this by far the best plan, the edge does not get rubbed away more in one place than another. Then, as you cannot sharpen the face, which is hollow, on the oilstone, you take the slip between the thumb and finger of your right hand, and holding the gouge firmly in the left, you apply the slip. Slips are pieces of Turkey or other stone about four inches long and one and a-quarter wide. They are of various thicknesses, generally a quarter of an inch or more, bevelling off to half that thickness at the other edge. Each edge is rounded off so as to fit the bottom of the gouges, which cannot, of course, be sharpened on the inside with a flat stone. The safer method of using the slip is to lay the back of the gouge at an inch and a-half from the edge on the edge of the table; the edge of the tool must be slightly raised, and the slip can then be applied with perfect safety and with great effect. If the tool is held upright in one hand, and the slip applied with the other, the stone is apt to glide off the tool, if it is a rather flat one, and a cut finger is frequently the result.

The V tool is the most difficult of all tools to sharpen. It requires great care and constant vigilance to guard against rubbing it down more on one side than the other, and to rub each bevel evenly, neither too much towards the point or to the upper part of it. Rubbed down too much towards the point, it generally makes a notch just above the point. One end of a slip should be ground down to a sharp V edge, so as to sharpen the tool from the inside also.

You must get from the saddler a bit of hard, smooth

leather, like what is used for stirrups; it must be one and a half inches wide, and about eight inches long. Glue this on to a board, and make some kind of case for it; rub on it as a foundation some emery paste, procurable at a cutler's. Now draw your tools over this, and they will be sharp as razors. When your strop requires freshening, put on a few drops of sweet-oil, rub in with your fingers, and dust it with finely powdered emery. The best plan for doing this is to keep your emery in a wooden tooth-powder box, in the lid of which a small hole must be bored. With this you can dust on the emery nicely, and it keeps it well. Some people recommend a piece of soft buff leather, but this, I think, is a mistake, and I know it does not sharpen nearly so well as a piece of hard leather that will not yield to the tool; for you can quite understand that if the leather is soft and yields, it will curl up behind as the tool passes on and round off the edge, instead of leaving it a true bevel.

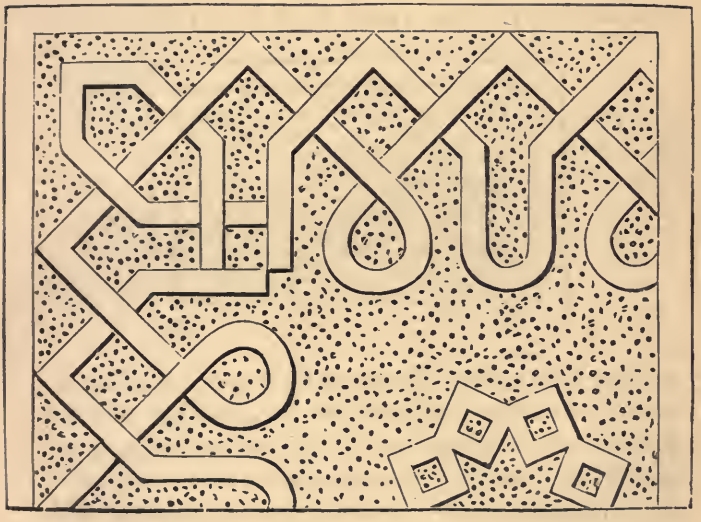
I cannot tell the price of a carver's bench, but I know that a carpenter's bench, with vice and stop or dog, as it is sometimes called, complete, costs from twenty-five to twenty-eight or thirty shillings; and a carver's bench, with vice and tray complete, would not cost more. I have a smaller bench, which would suit the greater number of you, my young friends, admirably; it is thirty-two inches long, eighteen inches wide, one and a half inch thick; it is thirty inches high, has a small drawer in the centre, and four holes on the top for the holdfast clear of the drawer. It can be carried into the drawing or sitting-room, and if you put under it a newspaper or two to catch the chips, you may carve away without fear of sour looks from Mary the housemaid, who, seeing the care you take to avoid giving her trouble, will say, "Well, Master John is a thoughtful young gentleman."

Now, having told you as much as it is necessary for you to know at present about your implements, we will begin a little diaper carving, as it is called.

First, you must get a piece of nice dry, well-seasoned wood, oak or walnut, a quarter of an inch thick. Suppose it to be meant for a cover for a book, have the edges bevelled off, the wood finely smoothed and French polished (I will tell you about French polish by and by); then take your glue-pot, break a few pieces of glue about the size of a shilling, put them into the glue-pot, cover them with water, and half fill with water the outer vessel, and put it on to boil. As soon as the glue is melted, put a little on the four corners of your piece of wood underneath, and a patch on the middle; then all over the wood below put a piece of stout but fine white paper, and press it down on the glue. Now put corresponding patches of glue outside the paper, and then press the whole down on your working board. As soon as it is dry, you will be ready to commence operations.

Fix upon some simple pattern, and trace it over on some rough tracing-paper; then pin it, or better paste it, on to the bevel, so as to fix it firmly. Now take the tracing-point and go over the whole pattern carefully, so as to leave a fine line everywhere. Remove the pattern. screw the board down on to the table with your cramps, and see that it is quite firm. Take the V or parting tool, hold it in your right hand at a proper cutting angle, put your left wrist on the wood to be operated on, pass your hand over the steel, the thumb underneath, and the tips of the fingers resting on the work. This will give you perfect command of the tool, will prevent its slipping forward, enable you to guide it round the curves, and the thumb being under the tool, you

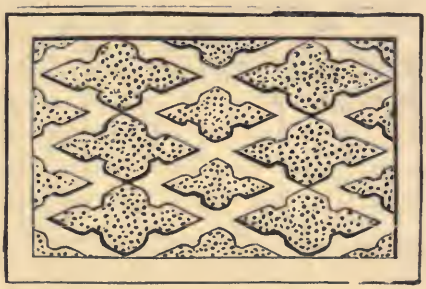
can grasp it at any moment with the whole hand Take out no more wood than just sufficient to mark the pattern well. Then take the star punch, and hitting short, sharp strokes with the hammer, begin and punch down the wood as marked in the annexed illustration. Whilst punching the wood, you must slightly turn the punch round after each stroke of the hammer, so as not to give the grounding a liney



appearance; and one more caution, if you see that the punch raises little chips of wood, try the other way of the grain. If you carry on your punching in the drawing or sitting-room, use the chunk of wood I mentioned, so as not to make much noise. It would be far better if you have paper enough to turn it over the bevel, and paste it underneath before glueing the work on to the board. When the work

is finished, take a common table-knife, pass it between the piece of work and the board, and the paper will split in half easily, and the work become detatched. Scrape off the paper, and glue. The best glue is clear and transparent, without spots or streaks.

The effect of this diaper carving is very good, the punching down the wood throws the pattern up in relief, requires but a little care, and is easily done. You should practise a little with the V tool on a spare bit of wood before trying it



on your book-cover. The faults to be guarded against are cutting too deep, going off the line, and not sweeping smoothly round the curves. The V tool is ground on the outside with long bevels, and where these bevels meet, below the point of the V, a sharp edge is produced. This edge should be slightly rounded off; the tool will then work more easily round a curve. You can, if you please, mark the curves by a gouge, holding it quite upright, and pressing it down with the hand. Many do diaper carving in this way without the V tool.

CHAPTER II.

HE former chapter concluded with a short description of diaper carving, the effect of which is greater than can be imagined. It must be tried; and it has also this great advantage—it can be done with great rapidity, giving great results with little trouble.

The next step is fret cutting and perforated carving.

Fret cutting may be described as the art of sawing out the groundwork of a pattern. The fronts of cottage or upright pianos are usually fret cut, and sometimes the patterns are so beautiful that they look like lacework turned into wood. When a pretty pattern is nicely and cleanly cut, the effect is always pleasing, but when the carver takes it in hand, rounds off the stalks, hollows out and veins the leaves, cuts the flowers into shape, and gives a natural undulation to the whole, the effect is magical, and seems to endow the wood with life.

There is this advantage in fret cutting and perforated carving, that it is an employment suitable for the ladies of a family, and can be carried into the drawing-room. Numbers of ladies practise this beautiful art, and are really most skilful at it. One lady of my acquaintance is carving a set of chairs for her dining-room; and a lady of my own family, at her first trial, fret cut a bracket of a very complicated pattern

and executed it as well as if she had practised the art for years.

The tools required for fret cutting are very few and very simple—a steel bow saw, or wooden frame saw, costing from 6s. to 12s.; a few saw blades, 6d. per dozen; a brace and bit for boring holes, 2s. 6d.; a couple of fine gimlets, 4d. each; two smooth files, one flat, one half round; a cramp and holdfast, 3s. 6d., for screwing the working board, or horse, to the table; a sheet or two of glass cloth; and a small glue-pot. This working board, or horse, is a board about $\frac{3}{4}$ in. thick, 18 in. to 20 in. long, and 15 in. to 16 in. wide. In this board two deep notches are cut, one on each side, and at opposite corners. One notch is 4 in. deep and $2\frac{1}{2}$ in. wide; the other $2\frac{1}{2}$ in. deep and 1 in. wide. Each notch to be used according as the pattern is fine or large. I give an illustration. Now, get a nice, dry, well-seasoned bit of walnut wood, $\frac{3}{10}$ in. thick when planed and smoothed, and your pattern having been taken off on tough tracing paper, stick it on the wood with well made paste. As soon as it is dry, take your brace and bit, or your gimlets, and bore holes at convenient spots on the wood to be cut away. I will show further on how this should be done. The hole, thus bored, is called the saw gate. The horse must now be screwed to the right hand corner of the table, the edge of the board parallel to the edge of the table, and the notch or V projecting beyond the table towards the operator, the point of the V an inch from the edge of the table to avoid accidents. Take a low seat, so that your shoulders may be about on a level with the horse, unscrew the holder at the end of the bow, release the end of the saw, pass it from below through the saw gate, make it fast, screw up the saw (the teeth should point downwards towards the handle)

Now put the hole, or saw gate, over the V, with the bow of the saw frame turned to the right; commence sawing, pulling the saw downwards with steady, regular strokes, then with the left hand placed firmly on the pattern, push it towards the saw (turning and guiding as it may be necessary) with a slight but steady, even pressure. Don't hurry, go slowly at first, until you get the knack. I should advise the beginner to use No. 6 saws. I use one of a much coarser size, and can cut very delicate work with the greatest precision, and double the rapidity to be obtained with a finer saw. I commenced by using Nos. 4 and 5 saws, but I will never again use a fine saw when I can possibly use a coarser one, the gain in precision and rapidity is so great. Then the finer saws, being thinner, are apt to wander off the line, unless kept well stretched and most carefully worked. Of course, for inlaying and very fine small work, fine saws must be used.

To most people this method of sawing out a pattern is inconvenient, to many it is intolerable, to all it is tedious. To those who find it intolerable or even inconvenient, if they do not possess a carver's bench with screw, in which the work can be held upright, and have not the means of procuring a sawing table, I would recommend the wooden frame saw and spring vice; by the latter, the work can be fixed upright to any table that is firm enough. Then seated on a common chair, and the pattern facing him, the operator can saw away at perfect ease.

These saw frames and spring vices can be procured at Mosely & Simpson's, King Street, Covent Garden. But both these methods of fret cutting and sawing are tedious in the extreme even in the most skilful and practised hands, and are very far from being precise. The saw, especially in the hands of a beginner, cannot always be kept mathemati-

cally upright or horizontal; the consequence is, that too much wood is very frequently cut away from the under side, or else not enough. This gives the work an uneven, lop-sided appearance, and utterly spoils the effect in some delicate piece of work, where a mere shave alters the proportion and destroys the symmetry of the curves. For these reasons, I would strongly recommend to all who desire to excel in this most beautiful and absorbing art, to make a fret cutting table, if they cannot afford to purchase one of the various patented metal fret cutting tables now coming into use. The expense of making a table is very trifling, and as it will afford much amusement and greatly interest my young readers, I will describe and explain every part, so that they make it at home, or get their friend, the village carpenter, to make it out of any odds or ends he may have at hand. On the following page is a general view of my table.

A, the top of the table; it measures 5 ft. by 1 ft. 4 in. N.B.—4 ft., or 3 ft. 6 in., would form a convenient table.

B, B, B, B, the four legs morticed into a thick piece below, H, projecting 4 in. beyond the legs; in this projecting part the treadle J works. The top of the table should be 2 ft. 6 in from the ground; C, C, C, C, four upright pieces, 1 in. square; to support the cross-bar they are let into the top of the table, and then screwed on to the bar M.

D, the cross bar, 1¾ in. by 1 in.; top of cross bar should be 1 ft. 4 in. from top of table; E upper saw bar.

F, lower ditto, both of the same size as cross bar; G, slides going through table top, and connecting upper and lower saw bars, measuring 1¼ in. by ⅜ of an in., firmly morticed into upper saw bar.*

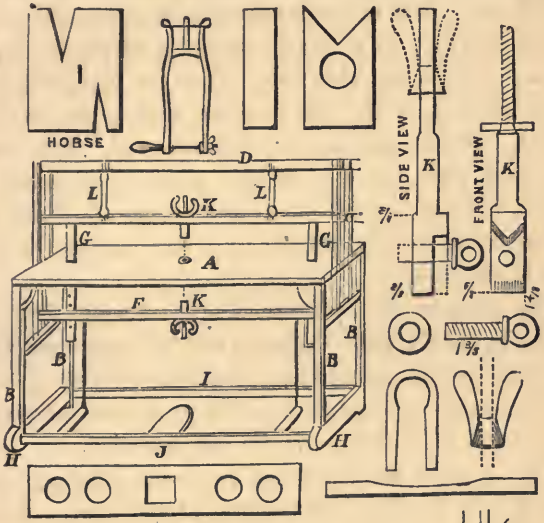
* These slides should fit very accurately in the morticed holes, but at the same time should slide up and down with perfect ease.

H, the lower pieces described at B.

I, bar connecting the legs.

J, treadle bar, with treadle and two arms; the treadle bar $1\frac{3}{4}$ in. square, the treadle and arms 1 in. thick, 9 in. long.

K, the clamps for holding the saws, of which I give



drawings; the lower part should be of steel, and roughed as marked in drawing.

L, the springs. These springs are made of solid sound india rubber, $1\frac{3}{4}$ of an in. in circumference, 6 in. long, to be purchased at any india rubber shop. The way to prepare them for putting on the bar is this—get a half-penny cane, cut off 4 in. of it, split this piece in half, smooth each half on the inside, and then thin them in the middle, leaving an inch at each end the full size; soak them in water, so that you can easily bend them into a loop without splitting;

wrap a bit of old kid glove round the end of the india rubber; bend the cane loop over it, the cane to go an inch down each side, then with some strong fine string, well rubbed with cobbler's wax, bind the loop on as tight as you can. If the inside of the cane has a notch or two cut in it, the loop will never draw. There is one disadvantage in these india rubber springs, that they are constantly snapping where the loop is put on. A far better plan is to make the upright higher, and to fasten on to the cross bar a bow made of good straight grained, well-seasoned ash, or of lance-wood. This never gets out of order, and if a suitable piece of ash cannot be had, the bow can be made out of thin battens of ash laid one over the other, like the plates in a carriage spring. I have given up the springs.

The arms of the treadle should each have an iron eye, screwed in exactly under the lower saw bar, and corresponding eyes should be screwed into the lower saw bar.

Some stout twine passed from the arms to the bar connect the two, and enable you to set the saw in motion.

The hole for the treadle bar in H should not go right through, only to about three-fourths of the thickness of H. When the treadle bar is in its place, a hole is bored through the remaining thickness into the treadle bar and a good long screw inserted; this keeps the legs together, and prevents the accident of the treadle slipping out when moving the table about from place to place.

The table of which I have here given the description is unusually long, and one very much shorter will be better for young people. Three feet six inches to four feet is a very nice size, and can be moved about easily. The top of the table should be of oak, beech, elm, or ash. The work slides round much more smoothly on hard wood; on deal it is apt

to stick, and the soft deal gets easily indented, and becomes rough.

The size of work that can be turned out by a table is measured by the distance from the saw to the slides; therefore the slides should be as near the uprights that support the cross bar, and as far from the saw as possible. The clamps for the saws are put through the exact centre of the saw bars, and to prevent them from turning or shifting as the work is turned against the saw, a small iron plate 1 in. wide, made of a bit of thick iron hoop, is let into the lower edge of the upper saw bar, and into the upper edge of the lower saw bar; and through these the clamps pass. A brass collar passes over the screw, and lies on the bar for the nut to work upon. The clamps should move quite freely up and down in the holes, so that they may be easily screwed up or let out.

It only remains to say that the springs may be fastened to cross bar and upper saw bar by stout twine passed through the cane loops.

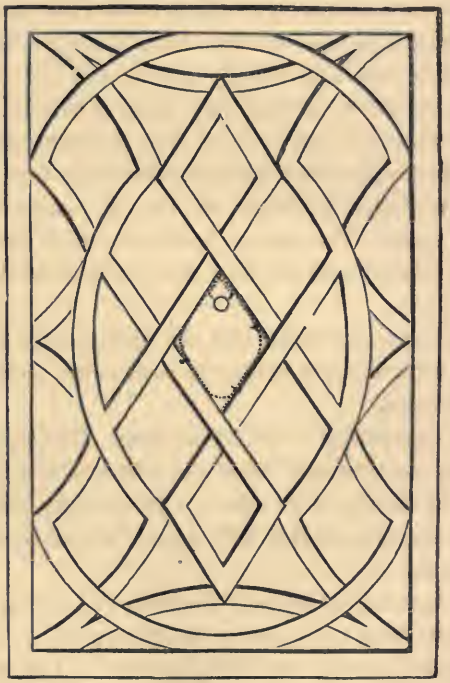
The saws should be six inches long. The top of an old kitchen dresser, or any bit of old well-seasoned hard wood, will do for the top of the table; if joined down the centre it will not signify, provided it is joined in a close, workmanlike manner.

The legs may be of deal; the cross bar, slides, saw bars, and treadle must be of oak or ash; but outsides, or odds and ends of oak or ash, are cheap enough. The clamps for holding the saws are the most expensive part of the whole, but they will not cost much. A patent metal fret-cutting table will cost from four or five to ten guineas, and they do not cut a bit better than the table I have described. Moreover, they have this disadvantage—they cannot be readily

moved from room to room on account of their great weight.

With this table I have described, wood an inch thick can be cut. I have done it frequently with a coarse saw, and then any carpenter, or any youth with a few tools and a

No. 1.



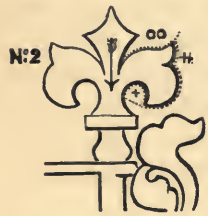
little knowledge of carpentry, can make this able. I have even seen a common small deal dressing-table converted into a fret-cutting table on this plan, and myself helped to convert it.

Now we will suppose the saw and horse to have been

purchased, or the table made, the pattern pasted on a nice piece of wood. Let us suppose the subjoined to be the pattern. This is quite a simple pattern that I have drawn expressly for this first attempt; the lines in great proportion are straight, and the curves are easy. Now take your brace and bit, bore a hole in the centre compartment of the pattern where I have drawn one; loose the end of the saw, put it through the saw gate, make fast, and screw it up moderately tight until the saw rings clear on being touched. Saw from the hole down towards the corner next you, as marked by the fine dotted line, quite cutting the line of the pattern.

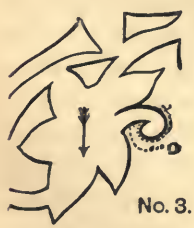
Return to the saw-gate, continuing the motion of the saw whilst you move the pattern back. Now saw down the other side quite into the corner, and this will take out the little piece, turn the pattern quite round, and saw down the right side, quite into the corner, cutting the line all the way along. When you get to the corner, draw the pattern back to the little cross, then cut across the corner in the direction of the dotted line, continue sawing down to corner opposite the saw-gate, draw back to the †, saw across in direction of dotted line, continue in this way until you have cut the whole piece out. Now go back, and cut out the little bits left in the corners. The reason for this mode of sawing is obvious; if you try to turn in the corners you will boggle about it, perhaps cut into the pattern, and so mar the effect, perhaps break the saw; and you must be cautious at all times in drawing a pattern back from the saw to continue the motion of the saw, for when the wood is quite dry this clears the cut from sawdust. But should the wood from any cause be not quite dry, don't use force to draw the pattern back, as you will inevitably break the saw; rather release the saw at both ends, and draw it out. When using the fret-cutting

table, you must pay great attention to keeping your work directly in front of you; don't press the saw out of the perpendicular to right or left, and don't try and saw too fast; if you do, the work will jump, and you will not cut true. When working, always have the end of a tallow candle at your hand wrapped round with paper, and touch the saw with it now and then, especially when turning in a small



confined space marked † in pattern No. 2, the saw will cut it quite clean and easily; but if the wood is thin, and you are cutting across the grain, you must take great care not to break off the part that is being sawed. To avoid this catastrophe, saw the extremities first. Look once more at the pattern. I have drawn an arrow to show which way the grain runs.

Now you can readily understand that, if you cut out the part at † first of all, then the part at oo, and finish off with the outside ‡, the chances will be ten to one that you will break the work at the narrow neck. So first of all cut the outside right round to the point next the †. I have marked the course with a dotted line, cross over, and cut round the



curve to the point. Then go to the upper point at oo, and cut down to the inner angle; draw back, and then from above cut the piece out. In fine, don't cut away in any case the support of your flower or leaf until the last, and observing this precaution you will seldom have a fracture.

One more example: here, No. 3, is a leaf from the lower part of a bracket; the grain runs in direction of the arrow. To

cut the little projecting knob begin at †, cut round into the corner, draw back to o, cut round again into the corner, clearing part of the neck; go back to †, and cut into the upper corner. Pursue this system, and, as I said before, you will rarely have a fracture.

Some people recommend commencing with the outside: carefully avoid this; cut the whole interior first, and finish with the outside. You can easily suppose that such little projecting points and knobs, as shown in this last illustration, will catch in your dress, and get broken off. I must give another illustration in my next chapter of one or two other precautions to be taken and modes adopted in sawing out narrow and difficult places. It will be as well to provide yourself with a bradawl, ground to a sharp point to lift out the pieces as they are cut by the saw, otherwise they may hinder the motion of the saw, and, by getting into the saw-hole in the table, prevent the work from sliding round.

CHAPTER III.

AT the end of my last chapter I said I would give another illustration of one or two precautions to be taken and modes to be adopted in sawing out narrow and difficult places; but let me urge you to saw out the whole of the interior of your pattern first, and reserve the outside to the last. I speak from absolute experience. I commenced by sawing the outside first, but the projecting points and knobs were always catching in my loose coat, hindering my work, and in some instances the knobs got broken off. Here is an excellent illustration of what I mean by the support of a leaf; it is a difficult place, where great care is required, especially by a beginner, to avoid breaking off the leaf. It is part of a table easel to support a book; the grain of the wood runs across the pattern, as shown by the lines and the direction of the arrow. It will be seen at once that a slight want of caution would break off the leaf at the narrow neck between the o o. Commence then at the mark H. Cut down the right side in the direction of the dotted line. When you have cleared out the whole of that side return to H, cut down and clear out the left side, leaving to the last the piece of wood between the x x, which is the support of the leaf; if you should cut this out and the corresponding piece in the oppo-

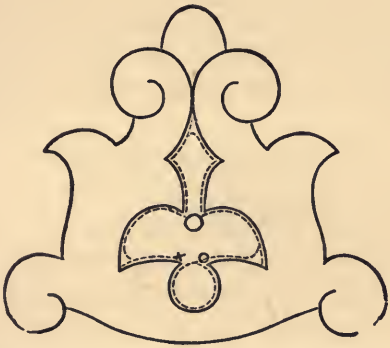
site side of the leaf, and then try to finish by cutting out the small pieces at the top of the leaf, it is ten to one that you would break it off. So cut and clear out the support last of all, cutting first down the side of the leaf, and afterwards down the other side in the manner presently to be shown, to get the piece out. Now this place between the x x is also an excellent illustration of the method to be adopted in sawing out narrow places. Cut down along the side of the leaf, from x to o, draw back half way, cut across, and down the opposite side to o, and take the piece out; you can then

turn the work round, and cut out the remainder of the piece. It sometimes happens that the wood on which you are operating has got slightly damp, in this case the sawdust may clog the cut and prevent the pattern from being drawn back; in this case, as I recommended in my former chapter, loose the saw, and draw it out, don't run the risk of breaking it. I am supposing you to be using a sawing table (fret-cutting machine), such as I have described, as it is a thousand times preferable to the bow saw and horse, and there is such interest in making it, and satisfaction in using it when made, that I am sure my young friends will try to

procure one; and I may here mention for those who can afford it, a very neat, handy, and efficient fret-cutting table can be bought for forty shillings, and less, of Mr. Thick, 188, Weedington Road, Kentish Town, London, and that he supplies prepared wood, etc.

Now we will suppose that you have got the fret-cutting table, a piece of wood, and some neat, simple pattern pasted on, and are ready to begin. First of all study your pattern, and see where to bore the holes, or saw-gates, as they are called, where will be the most advantageous spot for saving time and trouble. Mark the places with a pencil. This is most necessary for a beginner, especially if the pattern is at all complicated, else you may bore into the pattern as I once did, and so nearly spoiled it. I never even now bore the saw-gates in a complicated pattern without first marking them. When the saw-gates are bored, turn the wood over, and smooth off the chips or rags made by the bit and brace, else they will mark your table, and prevent the work from sliding round smoothly. Before going further I had better give an example of choice of the most advantageous place for a saw-gate. Here is a portion of a three-shelf bracket, a very pretty ornament. You see I have put the saw-gate at equal distances below the two upper interior points. This gives the choice of cutting round to right or left, or the narrow neck upwards. I cut round to the right, crossed over the neck below, from o to x; cut round again to o, and took the piece out, and then I cut round to the saw-gate, as shown by dotted line. If the saw-gate was bored in the middle of the piece to come out, there would be time and labour lost in cutting down to the edge of the pattern, whereas by boring the saw-gate where I have placed it, you are on the pattern at once, and can choose which

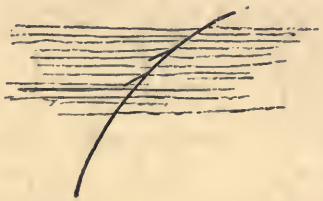
way you will cut. Now learn to saw with long strokes, so as to make use of as much of the saw as possible, trying to give a sharp motion downwards. This is most necessary in sawing a thick piece of wood, it enables you to cut more quickly and easily than if the downward and upward motions were equal.



Then learn to use the treadle with both feet, so that one foot can relieve the other, and you may saw without fatigue; at the same time you must learn to take short, quick strokes, for with these, and at the same time turning the pattern round the saw as a pivot, you can with a new sharp saw cut a small round hole not much larger in diameter than the width of the saw. One final caution I must give: when using a fine and thin saw on wood with a strong fibre you will sometimes find that when sawing outside a curve that runs diagonally across the fibre, the saw will have a tendency to wander off the line in the direction of the soft wood, between the fibre, as shown in the annexed diagram. To counteract this, screw up the saw a little, if you can with safety, and bear more against it with the hand that is oppo-

site the direction of the wandering, but take care not to press the saw out of the perpendicular, or you may make the work jump, and will not cut true. If this does not answer, make a fresh saw-gate, insert the saw, turn the work round, and cut the other way.

When in the course of sawing out the pattern so much is cut out that it becomes difficult to turn the pattern between the saw and the body of the operator, the saw should be taken out and turned, the teeth to the front. The amateur must practise sawing either towards or from him.



In my last chapter I gave several cautions how to avoid making your work jump. The saw catches it up, and the downward motion if the saw bangs it on the table, if this jumping is not caused by the work being held improperly (the saw being thus pushed out of the perpendicular), or being pushed forward faster than it can be cut, perhaps the saw is worn, and does not sufficiently clear itself; if so, you had better change it, the jumping may break some delicate part of the work. Your piece of work being fret cut, if you do not intend to carve it, you must set to work to smooth, polish, and varnish it, or, if the wood is white or light-coloured, to stain and varnish it. Suppose you are operating on a piece of walnut with a nice grain, and you do not wish to varnish it, first take off all the remains of the paper

pattern, and then smooth it with fine sand or glass-paper. Now, the way to do this is not by taking a sheet or half-sheet, folding it, and then rubbing it over your work; this would round off the edges, and give the work a heavy, ill-finished appearance. But if your work is not too large, fasten a sheet of sand or glass-paper down on your table by a few tacks at each end, and rub your work over this, first back and forward, and then with a circular motion; if your board had been planed before pasting on the pattern, a few minutes of the glass-paper, as just described, will smooth it most completely. Now, take a fine half-round file, and, going over the whole work, obliterate the saw marks inside the cuts, file off the rags left by the saw on the lower edges of the work, and correct the curves or lines that may be defective, and complete their symmetry. Where the work is too large or inconvenient to be sand-papered thus, I generally use a polishing-stick, a contrivance of my own. It is made in this way: Get two pieces of wood—ash is the best, but hard deal will do—two inches broad, twelve long, three-eighths of an inch thick, planed true on both sides. About a quarter of an inch from the edge of one of these pieces put in four long screws, so that they may project on the other side a quarter of an inch; file them off to sharp points; the heads of the screws must be flush with the surface of the board, or they mark your work. The first screw should be two inches from the top of the board, the three others at intervals of two and a half inches. Make corresponding holes for these points in the other board; then place the two boards together, plane the edges true, and round off the further end for the handle. Now open the boards, take a sheet of glass-paper, fix the edge of the paper on the sharp points, put on the other board, bend the paper tight round

the boards, leaving sufficient to go between the boards and over the spikes, like the other end of the paper. Open the boards, put the end in between, and close them. Now, if you have done this neatly, you will have a most capital tool for polishing any flat surface, and you can fasten your work down on your table, and rub it with this. Before putting the sand-paper on the boards, you should go over the paper, and pick out any knots or lumps that may be in it, or they will score your work, give infinite trouble to take out, and perhaps spoil your work. The work being nicely smoothed, if you don't wish to varnish it, apply a small quantity of good linseed oil, leave it a day or two to dry, and then polish it with a hard bristle brush. I use a brown bristle brush that is slightly curved. I once oiled some frames that I made for photographs, let them dry, as I thought, and polished them with the brush. The photographs were put in, and, as the corners only touched the edge of the frame, I put in a backing of light green paper, and hung them up with knots of green ribbon. The effect was very pretty. But the weather was hot, and in three or four days I saw with horror an ugly, suspicious mark on the ribbon of the nearest, and on looking closer I saw that half the ribbon was saturated with oil, and oil had also soaked into the green backing. I quickly took down both frames; the photos fortunately were uninjured, but I found that I had put on three times too much oil, and had gone near to ruin photographs that could not have been replaced. So take care not to use too much oil. In general I prefer to use yellow beeswax: I slightly warm it, rub it on a brush, and apply it to my work, warming the work also. It darkens the walnut nicely, not too much, and takes a high polish with continued rubbing. But to pure beeswax I prefer the

wax melted up with a little turpentine; this rubs on more easily, darkens the wood more, and polishes beautifully. White woods must be stained, unless they are sufficiently white to look well when simply varnished. The best stains are oak and walnut stain, without oil, particularly that rich brown stain used by the Swiss carvers. The former can be purchased at most oil and colour-shops, and the Swiss brown stain can be had of Loretz, at his Swiss warehouse, 6, Bridge Street, Bath.

These stains should be put on carefully with a fine camel-hair paint-brush, and a little at a time, so as not to make streaks on the work; but, before putting it on, it should be tried first on a piece of wood similar to that intended to be stained, till you get the shade required. When you have got the required colour, a hard bristle brush will polish Loretz's stain nicely. But should you wish to varnish the work that has been fret cut or carved, you must do it with brush-varnish, made with spirits of wine, using, according to the colour of the wood and the effect to be produced, dark hard varnish, pale hard varnish, or white hard varnish. These varnishes must be laid on with a camel-hair brush, as thin and evenly as possible. The first coat will be entirely absorbed by the wood, and if the grain of the wood is raised, it must be rubbed down with some very fine sand-paper, taking care that the absorbed varnish is thoroughly dry before using the sand-paper. Then put on the second coat, and again use sand-paper; if the grain should again be raised, you can then put on a third coat, and even a fourth, if the polish is not high enough. Pour a little of the varnish into an old wine-glass, and dip your brush in this; don't dip into the bottle, you will waste the varnish, and spoil what is left. Pour back into the bottle any that may remain, and clean

your brush with a little spirits of wine. If by any chance you should forget to clean the brush, or if no spirits of wine be at hand, and the varnish dries on the brush, put it down on your table, hammer the camel-hair slightly, and the varnish will break up into powder, and can be shaken off.

The best hard dark varnish is made by dissolving shell-lac in spirits of wine. If you wish to make a very superior varnish of this kind, select some fine clean shell-lac, break it up, fill a bottle about one-third with the broken lac, and pour on it rectified spirits of wine until the bottle is nearly full; shake it frequently till all the lac is dissolved, or until the spirit will not dissolve any more. If the spirits of wine is good, the lac should be dissolved in about thirty-six hours. The bottle must be very well corked. Now stand it in the sun for three days, taking care not to disturb or shake it, the fecula will settle to the bottom, leaving a clear brown liquid above. Pour off this supernatant liquor, and you will find it a very superior brown hard varnish, which can be put on your work with a camel-hair brush, or be rubbed on with a pad, as I will presently describe. All these varnishes can be bought of artists' colourmen.

French polishing is not a nice operation, but it is quite as well to know how to do it, as you may wish to polish a piece of wood for diaper carving, and a French polisher may not be at hand. French polish is made of one ounce of shell-lac and a quarter of an ounce of gum-sandrac, one pint of spirits of wine, put in a well-corked stone bottle, and kept near the fire until dissolved; but it is much better to purchase the French polish of some colourman or druggist. To French polish make a round pad of wool or cotton, or take a large roll of list or flannel, dip it into the polish, and put the pad into a piece of fine strong linen that is not

fluffy; dip your finger into some clear linseed oil, and dab the linen with it until the surface that comes in contact with the wood is slightly oiled; the oil makes the pad slide round easily, but too much oil will spoil the varnish. Having put in your pad, gather the linen firmly round it, and proceed to rub it on the wood in small circles; add more polish and oil as you go on. In a short time the polish will look greasy, but continue the rubbing, and you will soon get a fine polish. It requires a little knack to polish well, but it is soon acquired. The hard brown varnish I have described above can be put on like French polish. For white wood that you do not wish to colour, white hard varnish must be used, and for the foundation, or first coat, strong clear size can be used; it is a great saving of expense.

Let me recommend that, when finishing off, polishing, staining, or varnishing a piece of work, strict attention should be paid to proceeding in regular order—part by part, leaf by leaf; do not go dodging about from one part to another, but do each in succession, it saves an infinity of time, and spares the mortification of ultimately finding some place left unvarnished or unfinished.

The management of the "carvers' friend," the glue-pot, must conclude this chapter. Choose the glue carefully; it must be clear, transparent, and without spots, specks, or streaks in it. Salisbury glue is the best. The glue-pot is double; the inner pot contains the glue, the outer one is half-filled with water. This is a contrivance to keep the glue hot whilst being used, and to prevent the glue from being burnt by the action of the fire; in fact, it cannot be subjected to a heat greater than that of boiling water, as long as there is any water in the outer vessel. Having selected the glue, it must be broken up into small pieces, none larger

than a shilling. Put the broken glue into the inner pot, and pour on water sufficient to cover it; let it stand for at least twelve hours, when it will be found to have absorbed nearly all the water, and each piece converted into a thick jelly; pour off the water that may have remained unabsorbed, see that the outer pot has sufficient water in it, replace the inner pot, and set it to boil. When the water has boiled a few minutes, the glue will be ready; it should be the consistency of thin cream, and should run from the brush freely. If the glue is too thick, it will never make a neat joint; if put on too cold, it will not make a neat joint; neither will it make a neat joint if it is not well squeezed out, so as to leave as little as possible between the fractured parts. When you desire to glue up a fracture, warm the wood if possible, and make preparations beforehand to bind the fractured parts together when glued. If the fracture is an outside leaf or point of a delicate fret-cut frame, and there are no means of tying or wedging the parts together, other means must be adopted. Fasten the frame or whatever the work may be, firmly down on the table with your holdfast, putting a piece of paper under the fracture; put the glue pot for a minute or two on the fractured parts to warm them, apply the glue, press the parts firmly together with your fingers, keep pressing for two or three minutes, and then they may be left to dry. The paper prevents the glue sticking to the table, and can afterwards be scraped off the joint.

CHAPTER IV.

I WILL now suppose my young readers to have fret cut their pattern, to have purchased a few tools, and, anxious to carve up their work, to be looking for instructions how to proceed. I will presently recommend to their notice a particular pattern.

As a preliminary to these instructions, and with the intention of putting my readers in the way of excelling in this beautiful art, I will here lay down one or two maxims and useful rules that I wish them to impress on their memories and keep ever before them until the practice grows into habit.

And first—Whatever you cut, cut clean; leave no rags, jags, or fragments.

Clear out completely, and quite clean every angle and corner; it will make your work look neat and workmanlike.

Get your work as smooth as possible, with whatever tool you may be using before finishing with either file, scraper, or sand-paper. The less sand-paper is used the better.

Let every stroke of chisel or gouge be made and regulated by purpose and design, not hap-hazard or at random, and in order to this

Study well your pattern or design before commencing to carve it, and decide upon the effect to be produced, which way and how to lay and turn the leaves or scrolls, how

deep you will carve them, and how and which way you will turn or bend the stalks, so as to give a natural undulation and appearance to the whole work.

Put the real leaf (when carving foliage) by your side, and follow nature as closely as possible; you can have no better guide.

Keep your mind on your work and constantly on the alert, do not let your attention flag; remember that a careless moment may cause a slip of the tool, and blemish your work, or entirely ruin it.

Be particular in holding your tools; to a beginner this is most essential, or you may acquire bad habits. Right hand grasps the handle of the tool; left wrist down on the work; fingers of left hand over the steel; thumb underneath.

Build up your work, as it were, from the foundation; begin at the stem and go on to the leaves; don't skip from stalk to stalk, from leaf to leaf, or from one part to another, but bost* or finish each leaf or part as far as you can, before commencing another, and go through the whole work regularly. There are times and occasions, of course, when this rule may and must be violated, but experience will teach you.

In solid carving, the whole of the work must be bosted before any attempt is made at finishing. Every piece of work of any importance must go through the three stages—blocked out, bosted, finished.

If your work should be scrolls and shields, or work in the renaissance or older styles, observe the rule laid down; settle some plan in your mind as to the effect to be produced, and carry out the plan. It may, and I dare say will, be difficult at first to follow this rule; you may have to try a bit of

* To bost seems to be derived from the Italian word "Abbozzare," to sketch, outline, or from the French word "Ebaucher," to sketch, etc.

the work first, to form an idea of the effect to be produced, but bear the rule in mind and act upon it, as soon as you have gained sufficient experience, and can see with your mind's eye the completed carving in the rough wood before you.

I may here remark, parenthetically, that it is a good plan to have two pieces of work in hand at the same time, so that if one is large and intricate, and likely to last some time, you may relieve the eye, if it gets wearied or confused, by turning to the other. An artist not pleased with the effect of his picture, or if he fails to catch the desired effect, puts it aside for a week or ten days, or even more, and works at something else, or gives himself a holiday; then when eye and mind are quite rested, he takes again to his picture, the fault at once becomes apparent, and the remedy suggests itself to his mind. In like manner you can rest eye and hand by changing one work for another, leaves and flowers for scroll work, and so on.

If in a piece of work you are perplexed how to proceed, how to curve or turn a leaf, or if the effect does not please or satisfy you, and there is no one at hand whom you can consult, put the work aside for a day or two like the artist, and on taking it up again the cause of failure and the remedy, or the way to proceed will, in nine cases out of ten, at once suggest itself.

Learn to use the tools and carve with the left hand as well as with the right, it saves an immensity of time and trouble, as you will rarely have occasion to shift the work. I have seen the French carvers at work; they seldom use screw or holdfast for small work, but wherever they can, they fasten the work down on their bench with three or four slim nails, called "pointes de Paris," similar to those used in

French wine cases. They carve equally well with the left hand, shifting the tool from one hand to the other as occasion requires, and go round to the further side of their bench occasionally, if there is room, and they rarely have occasion to shift the work that is once fastened down.

Practice with the left hand on any bit of wood or piece of work you do not much care about, and you will soon be able to use the tools quite respectably with the left hand. With a broad shelf to your bench, it will be impossible to go round to carve there, and the work must be shifted; but with the carver's screw, the use of which I will explain further on, the shifting the work is a momentary affair, only remember that the less often your work is shifted the better, for moments swell into minutes, and an aggregate of minutes makes up more time than any one should permit himself, or should like to lose. It is by economising his moments, as well as by his skill, that a good workman is able to get through the amount of work required to gain a comfortable livelihood.

To these rules for work let me add a recommendation to use red ink for copying your patterns; not the common office red ink, but the red ink used by engineers for their plans—it is pure carmine. For this recommendation there are several reasons—if patterns for fret cutting are copied with black ink, the colour is so nearly like that of the saw, that if the day is cloudy and the light in the room not very strong, the two combine and embarrass and weary the eye, whereas carmine being a perfect contrast to the colour of the saw, the eye distinguishes it at once, and follows the motion of the saw along the line without embarrassment and without fatigue; the dark colour of the black strains the eye, the carmine does not.

Again, if you would wish for any reason to reverse a pattern, either to humour the wood, which may not be large enough for the pattern if laid on the right way, whilst it would be large enough if turned the other or reverse way; or if you should wish to make a corner bracket, for instance, the pattern for one side must be laid on the reverse way for the other, unless you have the pattern for left as well as right, or have attained sufficient knowledge and skill to carve it on the reverse side; in both these cases the ink would come in immediate contact with the wood, which being wetted by the paste would draw the ink, and thus cause a deep stain, which would have to be carved or scraped out, and as this might oblige you to lower the more prominent parts of your carving, it would greatly mar the effect by giving it a flatter appearance than was intended. In that beautifully white wood, sycamore, a black stain on the prominent feature of the carving would be almost irreparable. When the most prominent feature of a carving is lowered, the other parts are thrown up in proportion. It will be as well always to bear this in mind, it may prove useful in many cases.

Red ink (carmine) does not sink into the wood, but can be washed or scraped off easily.

Now in respect to your tools; they must never be left blunt or notched, but be ground or sharpened at once, and put in their proper places. You will frequently have to use a variety of tools on some small intricate piece of work, taking them quickly up one after the other, and you will have to put them on the table close by your work; learn to do this in order, each class of tool by itself, so that you may not lose time in hunting for a tool. Different carvers have different methods of laying their tools on the bench; some

lay them with the handles towards them; others lay them head and tail; others again lay them with the steel towards them, and this plan is most commonly adopted, because the eye at once selects the tool required. But whatever plan you adopt keep to it, and carry it out consistently.

Learn order and neatness; return every tool to its proper place on the shelf each night, and after finishing any piece of work clear the bench, and sharpen your tools before commencing another. Remember and act up to the wise old adage — "A place for everything, and everything in its place;" so that you may be able to find any particular tool at once, even in the dark.

Utilize every minute you have to spare; if there is not light enough for carving, sharpen and put away your tools, and put your workshop in order.

Do not throw away your broken saws or tools; keep all the pieces, you will often find use for a piece.

Take care not to let oil stay too long on your oil-stone, it cakes into a tough sort of varnish, but have a coarse duster or bit of coarse linen cloth at hand, and with this wipe the stone clean as soon as it gets dull; put the cloth down by the stone, and after sharpening your tools on the stone, wipe them on the cloth to take off the oil that clings to them. You must also, after passing your tools over the leather sprinkled with emery, that I have before described, rub them on the cloth, for a little of the emery and oil always clings about the edge of the tool, and would soil the carving perhaps in the most delicate part, where there may not be sufficient wood to spare to scrape off without spoiling the effect.

Take care you do not always *rub* your tools in the centre of the oil-stone; it would soon rub into a hollow, and you would

not be able to get the tools to a true bevel. Rub them in every part of the stone in succession; and when sharpening any broad tools, such as inch or inch and a half chisels, or plane irons, carry the tool right over the end of the stone, using each end of the stone on alternate days, or some similar arrangement. But should the oil-stone through inadvertence get into a hollow, level it again with the flat stone and emery and water, as I have before described.

Keep corks upon the ends of your skew chisels, V tools, and maccaroni tools; they are easily injured, and the two last are difficult to grind and sharpen.

As a final recommendation about your tools, don't hack them about for any common purpose. Keep a few rough tools for rough use, and joiners' tools for joinering your work. Let no one touch your carving tools but yourself, or some one who understands their use, and has some skill with them, and keep your carving tools exclusively for carving purposes.

Do not slur over these rules and precautions, and condemn them as tedious, but study them thoroughly, and practise them on every possible occasion; you will soon prove their utility, and they will save you time and trouble, and spare you much vexation.

Now, if my young readers are at a loss for a simple pattern for their first trial at fret cutting, I would recommend them to send to Messrs. Moseley and Simpson, of King Street, Covent Garden, for their pattern No. 111.

Here is a reduced copy of it, which by the courtesy of Messrs. M. and S. I am permitted for the purposes of this work to copy from their "Photographic Roll of Patterns." The patterns on this roll are all on a reduced scale, and the roll is sent to customers on application, to

assist them in choosing their patterns, and it may be kept two days.

It will be seen at a glance that the pattern I recommend is as simple as possible; great part of the lines are straight, the curves are easy, there are no complicated turns, no difficult corners, and the pattern is as elegant as it is simple. It is a book-tray end; the full size is six inches by five, and the price is only sixpence. Messrs. M. and S. will also provide prepared wood at two shillings, and for a first trial it would be better to get it ready prepared. If any of my young friends have carpenters' tools, and wish to

prepare the wood themselves, let them get good old well-seasoned Italian walnut, and dress it down to three-eighths of an inch.

The tray-board should be five-eighths of an inch, an the ends should be let in to half its thickness. The grooves for the ends must be made very exact and very neatly, and the ends must fit tight, and be glued in. When the ends have been fret cut the saw marks should be obliterated with a fine file and glass-paper; the wood may then be either varnished or slightly rubbed with wax and turpentine melted together.

When sending for the above pattern, I should recommend you to send at the same time to No. 35, a one-shelf bracket, 11 inches by 10, price one shilling; prepared wood, two shillings; number 119, an easel, picture frame, 10½

inches by 7, price ninepence; prepared wood for it, one shilling.

When my readers shall have fret cut these patterns, they will be perfectly competent to select for themselves the patterns suited to their powers, they must not always choose the most easy patterns, but go on to those more difficult; it will keep their interest and attention from flagging, and will bring out and improve their powers.

CHAPTER V.

MY young friends must not rest satisfied with copying patterns on tracing paper; they must learn the use of the pencil, and how to reduce or enlarge any pattern accurately. I will presently show them a very simple and very efficient, though rough-and-ready, way to do this, and they must learn and practise it, for without this knowledge, the use of many beautiful patterns, and many pieces of beautiful wood will be lost to them. Always use the best tracing paper when tracing a pattern, and it is a capital plan to have a fine piece of Bristol board to put under a pattern when tracing it, if the pattern is delicate, and the lines are to be very fine; if the pattern is bold and the lines are not to be very fine, then a couple of sheets of white blotting-paper is the best thing to put under the pattern.

And you must have two leaden weights, each six inches long, one and a half inch wide, two-tenths of an inch thick, covered with stout cartridge paper firmly pasted on. Lay these on the tracing paper over the pattern when tracing it, to prevent it from shifting, for if it should shift you would spoil your copy, waste your paper, and lose your time.

Economize your tracing paper as much as possible; save every little piece, small scraps are often most useful for taking off little portions of patterns that you may have, or may wish to alter, or little additions that you may have

sketched; and when pasting the pattern on to the prepared wood, use a good sized but stiff brush, what cooks call a paste brush will do. The brush must be an inch in diameter, and it must be stiff, or you will not be able to rub on the stiff paste thinly; so, if the bristles are too long, cut them, if you can cut them evenly; if not, then bind them round and round within an inch and a quarter of the end, with fine, strong twine.

The paste must be tolerably stiff, and quite free from lumps, and must be put on thin, and not "slopped" on too much; thin paste will inevitably make the wood warp.

Some pieces of wood will warp, however little paste is put on; in this case, take a sponge and wet the concave side freely, lay it down flat, put a heavy weight on it, and it will come straight; or if you have a good work-table, and the holdfast described in Chapter I., lay the board on the bench the wet side downwards, put a thick piece of board over the pattern (the piece of board must be nicely smoothed to prevent injury to the pattern), put them under the holdfast, and screw it down gently until the warped wood is quite flat. After wetting you should wait five or ten minutes to let the water soak in before putting it under the holdfast, it will prevent the chance of its splitting.*

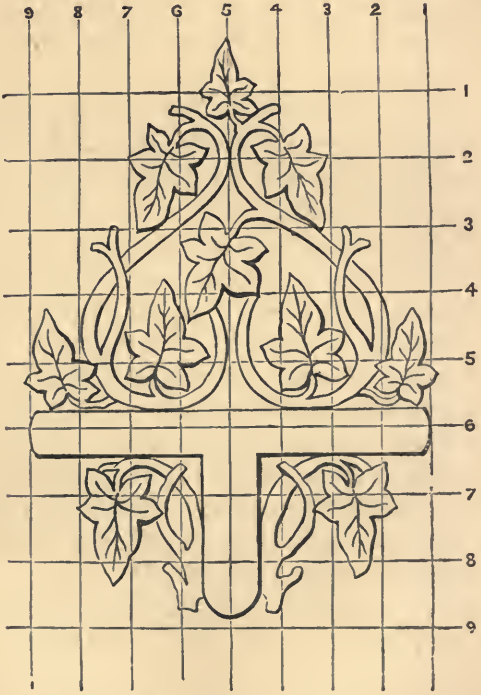
Now here is a pattern of a single shelf bracket, reduced by the plan I promised to explain, from a full sized working pattern.

The full size of the pattern is twelve inches from top to bottom, and eight and three-quarters from side to side; the breadth being a trifle more than two-thirds of the length.

I took the pattern, cut the paper to an exact parallelo-

* Wood that is warped can often be very quickly made straight, by holding the convex side to the fire after slightly damping the other.

gram. I then folded it down the middle, folded the doubled paper again, and then folded it once more; this made three creases on each side of the centre one, and four divisions, the edge of the paper completing the outward division, eight



divisions in all. Then I doubled the paper across, and folded it as before, exactly in half, then in half again, and once more in half, and this made eight divisions, and marked the paper with sixty-four parallelograms. Then I took a small piece of paper of the size and proportions I wished my

reduced pattern to be, three inches long, two and three-tenths wide, and folded it as I had folded the large pattern. Then where the lines of the large pattern, leaves, or stalks, crossed the creased lines, so I drew them on the reduced pattern.

In the illustration, I have drawn in ink the creased or folded lines to guide you, so now suppose you try to enlarge it to the full size. Take a piece of paper, cut it to the full size of twelve inches by eight and three-quarters, fold it as I have just described, and begin to draw the pattern. Commence wherever you will, the crossing lines will be your certain guide. For instance, take the top leaf on the right; you see that the upper inner angle of the leaf comes nearly on the second cross line a little below, and not quite half way between the fourth and fifth upright lines; make a corresponding dot on your folded paper. Then the outer angle of the leaf comes nearly on the same cross line, but a little above, and at the same time touches the third upright line; again make a corresponding dot upon your paper. Then you see that the point of the leaf touches the third cross line at a little distance from the third upright line; dot it. Then note where the lower angles of the leaf on each side are situated in respect to cross and upright lines, and dot their places, then the stalk, and lastly the upper angles of the leaf. When you have carefully dotted the various positions of the angles of the leaves, then draw lines from one to the other, giving them the same curves as the pattern, and you will have a perfect enlarged copy of the leaf. Hold the enlarged copy at a little distance from you, compare it with the pattern, and you will see at once where any little alteration may be required. Proceed in this way with all the leaves and stalks, and you will have a perfect enlarged copy

of the whole. On this system you can with facility enlarge or reduce any pattern, and a very few trials will make you thoroughly conversant with the method.

But if you should try any more complicated patterns, or find any difficulty in marking the positions of any of the parts, then you must sub-divide the squares in which you find the difficulty into as many more squares as may be necessary; I should think you would never require to sub-divide any square into more than four.

If you wish to copy or reduce any printed or painted pattern that can not or may not be folded, you must lay it down on a flat board, and with pins stuck into the board fasten stout white thread across the pattern; these will perfectly represent the creased lines. In fact, you must always be on the alert, and exercise your wits and ingenuity to overcome any difficulties you may meet.

I will by and by give you an instance out of many I know, of the ingenious ways in which the natives of India produce great results by small and simple means; and I trust it will encourage my friends, as I hope I may call my young readers, to search for and to try similar ingenious and simple solutions of any difficulties that may stand in their way.

Now, having enlarged this reduced pattern of ivy leaf bracket to its proper working size, suppose you try and fret cut and then carve it.

Choose a piece of Italian, or any nice straight-grained walnut, let it be half an inch thick; when prepared, this will give plenty of thickness to make the leaves undulate nicely, to lay them, that is to say, any way you please. By laying a leaf, I mean making it slope or slant to the right or left; that is, its right or left edge will be lower than the other, and so on.

I will suppose it to be fret cut, and that you are proceeding to carve it. First of all go over the fret cutting, and see if there are any irregularities to correct, any unevenness of outline to reduce, any little projection left by the saw in finishing the cut, and take your file and correct it. This is only for quite beginners, and for fret cutting that is not to be carved; when a little skill in using the tools has been acquired, and the eye has become accustomed to the work, all irregularities caused by the saw will be corrected in carving. Then the next thing is to fasten the work firmly down on the bench. I will suppose you to have a carver's screw; the head of the screw is squared, the point ends in a conical sharp, threaded screw; the nut is flattened and turned up at the ends, and on each end there is a square hole that fits the head of the screw, which, as I said before, is squared on purpose. Now, as the screw cannot be fixed into the wood of the bracket, which has not substance enough anywhere, another plan must be adopted; so take a piece of wood (almost any wood will do) four inches long, one and a quarter inch wide, one inch thick; bore a hole in the centre of it with a moderate sized gimlet, and insert the conical end of the screw. Put one of the square holes of the nut over the head of the screw, and using the nut as a wrench, turn the screw round until it is firmly fixed in the wood. This piece of wood is called a bridge, and is always used for fret or perforated work when there is not sufficient substance in the wood to hold the screw. If the fret work is too fine to allow the screw to be passed through it, then the holdfast is used with the bridge between it and the fret work, to prevent the teeth of the holdfast from marking the wood.

Now pass the screw through your fret-cut bracket, and

then through the hole in the table put in the nut under the table, and screw down tightly, and you will find your bracket fixed firmly enough for any ordinary force necessary to be used. But if you have to use the mallet to your tools, at a distance from the screw, and in the direction of the circumference of the circle that would be formed by the work turning round the screw as an axis, you will find it shift, and of course other means must be adopted to help the screw.

In most English carving tables there are square holes cut through, in which are inserted stops like the carpenter's bench stop. These stops are flush with the table, and can be knocked up as required. In aid of your screw knock up one of these stops; if it is not near enough to the work, you can insert a piece of wood between the stop and the bracket.

In my table, though there are three rows of holes that are made for the holdfast, there are no stops in them, but I have three or four large rough pegs ready to slip into any of the holes in aid of the screw; and I find this arrangement most convenient.

Now consider well how you will lay the leaves of the bracket; they must not be all carved and laid the same way; this would be very tame work, but you must vary their positions, making them lay or slope this way or that, according to your taste. On this point I am not going to advise you, excepting so far that you must have regard to the point and height from which the bracket will be viewed, and do not let the eye look under too many of the leaves. Accordingly, you must not make the point of the upper leaf, for instance, bend back, but rather bring it forward, and depress the two bottom holes: this will throw the leaf forward to

meet the eye; whereas, if you were to reverse the process, the eye would catch the edge of the leaf, which would be foreshortened.

When you have decided how you will lay each leaf, take half-inch, half-round gouge, and begin to hollow out the leaves, and in one direction or the other carve as deep as the wood will admit. When you have got the centre of the leaf very nearly to the required depth, take your pencil and sketch a centre rib from stalk to point; then, if you have not got a maccaroni tool, which, with its use I will describe hereafter, take your V tool and make a light cut along the pencil mark on each side of the rib to be left, commencing at the stalk end, leaving it the proper thickness, and running off gradually into the finest possible point. Now deepen the cuts gradually, and then with a flat gouge remove the wood on each side, according to the shape of the leaf. Take great care that your gouge does not carry off or score the raised rib.

Perhaps before attempting to raise a rib on your bracket, you had better practise on a spare bit of wood. Sketch out an ivy leaf, and try to cut the raised rib both with the grain and across the grain; the latter is most difficult, and requires a very steady hand and a very sharp tool. Half-a-dozen trials will give you a good insight into the art of making a raised rib. I am anxious you should execute it well, because it gives a much more handsome and artistic appearance to the work, which will well reward your trouble.

When you have got your leaves to very nearly the shape and thickness required, take a flat gouge, or any gouge more suited to the shape, and smooth them off, leaving as few marks of the tool as possible. But re-

member, whatever you do, don't make your leaves too flat, don't make them look like mere pieces of board.

The branches and stems must be nicely rounded and undulated; this kind of work is done with gouges, skew chisels, rasps, and files, and also with a peculiar tool, a double bent gouge. With this tool, of which I annex a drawing, you can cut along a straight line or bent stem when ordinary chisels and gouges could not be used, from the stem being sunk below the leaves, or some other peculiarity of position.

It is a first-rate tool for rounding or hollowing out foliage, or for scroll and shield work, where a straight-shanked gouge cannot be used. In carving your leaves you must pay particular attention to the run of the grain of the wood; and, indeed, in whatever you may be carving, not leaves only, or you may tear the wood, cut too deep, and spoil your work; so, if you find that the grain slips away from the tool, and you are cutting too deep, or tearing the wood, turn it round and cut the other way.

CHAPTER VI.

THE maccaroni tool is shaped in this way, ⌊⌋, so that it has three cutting edges, one horizontal and two nearly upright. The bevel of these edges is on the outside; it is a very difficult tool to grind and sharpen, and it should therefore always be kept in a sheath—a scissors sheath will do—or it may be thrust into a fine soft velvet cork. The V tool should be kept in the same way. The maccaroni tool is used mainly for making a raised vein or rib on a leaf. It will be seen that the sides or walls of the tool lean a little outward. This is to favour the cutting of the rib; if the walls of the tool were at right angles to the horizontal edge—that is, quite upright—it would, for all practical purposes, be no better than a very open V tool, and might be dispensed with.

Now, the way to use the maccaroni tool is this: You take a pencil, and sketch out the rib the width you intend it to be at its base, running off to a fine point as the leaf tapers to its extremity; then tilting the tool a little to one side, you make a cut all along the line, and then in like manner cut along the other line. Of course you will not sketch your rib until you have got the leaf to very nearly the depth it ought to be. The cut of the maccaroni tool should leave it the proper depth when the remainder of the wood is cleared away,

which must be done with a flat gouge. To make a really neat rib, it should be done with just two clean cuts of the tool. The caution that concluded my last chapter was this: "If you find that the grain dips away from the tool, and you are cutting too deep or tearing the wood, turn it round, and cut the other way. This cannot be too strongly urged upon my readers, therefore I repeat the caution; for if the fibre of the wood is strong and tough, by cutting against it you may quite spoil some nice piece of work, not only by cutting too deep, but by tearing the wood in places where the marks could not be obliterated, or where the work could not be altered.

But if the nature of the work admits of it, you can also cut across the grain; indeed, in many cases it is far easier to cut across the grain than with it, and in due course I will show how cutting across the grain will greatly facilitate your work.

Now, it will frequently happen, when carving foliage, for instance, that, from the form or position of the leaves, you have no option, but must cut against the grain, and this may happen in a place where there is nothing to spare. In this case the wood may be taken down by a file or a riffler, which is a carver's bent file, and of which there are many shapes and sizes, adapted to every occasion; but if there is rather more wood than can conveniently be taken down by the riffler, or it is otherwise inadmissible, make use of a sharp half-round gouge, keep your hand low, press firmly on the wood, and take off as thin shaves as possible. See that your gouge is as sharp as oilstone and razor-strop can make it, and then, whilst pushing on the gouge, turn the wrist round. This makes a sort of drawing cut, and if you take off thin shaves, as I have advised, you will, nine times out of ten, produce a quite clean cut, however cross the grain may be. This method of cutting must be practised, for it is most

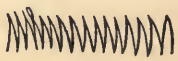
useful, and it must be practised turning the wrist to the right as well as to the left, to adapt your cut to circumstances. For turning the wrist to the left, the tool handle must be held in the usual way, the hand over the handle; to turn the wrist to the right, the hand must be under the handle. But this is amongst the many things that only practice and experience can teach. I can but show the road to follow; to persevere in it rests with yourselves, and on yourselves far more than on teaching or the teacher depends your success in this delightful art.

Now let me strongly and earnestly advise and urge all my young readers to learn at once to use their tools with the left hand as well as the right. It will increase their power of carving immensely, and enable them to carve more expeditiously, saving the many minutes that would otherwise be expended in shifting the work under the screw, or holdfast. Don't say to yourselves, "Oh, I can't use my left hand; there is no use my trying." You can use the left hand. The left hand with practice can do everything as well as the right; where it cannot, it is from want of practice. If you are not quite convinced as to the capabilities of the left hand, just observe, the next time you dress yourself, how expeditiously it can button your waistcoat; and when you sit down to breakfast or dinner, see how deftly it can handle the fork. I daresay that in carving wood you will find the left hand rather clumsy at first, but persevere for a week or ten days, and you will find it worth while to continue to persevere. The left hand will do everything as well as the right, but it must be practised in youth; at a more advanced age it is less capable of learning. Begin to practise at once; fasten a bit of any wood down on the bench, take a gouge in the left hand, hold it as the right hand holds it, and place the

right hand in the position of the left; then "whittle" away at the wood, turning the gouge with the wrist to right and left to make clean cuts. At Chapter IX. of this Manual, full instructions on this point will be found. Now draw a little pattern, and try to carve it as neatly as possible. Try and take off the smallest possible shaves, and exercise the hand in every way. Having carved the leaves of your bracket, and got them as smooth as you can with your tools, you must now proceed to round and ornament the stems and branches. The rounding is done with skew chisels, gouges, and the double-bent gouge, of which an illustration was given in the preceding chapter, with files, and sand, or glass-paper or glass-cloth. The stems and branches look very well when simply rounded and tooled with the V-tool, or tooling-gouge, which is the smallest sized round gouge—one-tenth of an inch; but thus treated the stems look rather tame, so you must vary the treatment by imitating the knobs and hollows and uneven recesses that are seen in the real stems. A very effective and artistic way of ornamenting the stem is to imitate the cicatrice left by a broken-off leaf, or by a torn-off branch; the latter generally leaves a deep hollow, just where the branch sprung out of the stem. This hollow dies off gradually to nothing, and if some time has elapsed since the branch was broken off there is always a thickening at the edge of the bark which makes the hollow look deeper. Then you can imitate the excrescences that are frequently seen in old stems or branches, in oak particularly, or you can imitate a branch cut off, of which the stump is left. Then the roughness of the bark is imitated by close incisions with the V-tool, or tooling-gouge. These incisions must not be long, continuous parallel lines, but they must be varied by little short strokes or digs, as I may call them, and these little strokes or digs must not

be parallel one to the other. This would be formal, and tame, but their direction must slightly vary, as well as their length and breadth and depth.

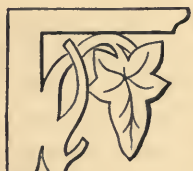
Then there is another species of ornament most useful for the bend of branches, and which is to be seen in Swiss carved brackets. This may be called the zig-zag pattern or ornament. It is intended to represent the cross fissures and marks that are seen in the bark of some trees at the bend of the branches. It is done with a flat or quarter-round gouge, the hand swaying from side to side, and at the same time advancing by alternate steps each corner of the tool. Here is an illustration.



When the left corner of the gouge is to be brought forward the hand leans the tool over to the right to lift out of the wood the corner to be brought forward, and when the right corner is to be brought forward the hand leans over to the left, and so on. This when done across the grain is easy enough, the pieces come out clean, and leave a neat zig-zag. But to do it with the grain requires a practised hand, a very sharp tool, great pressure, and a particular knack which is not easily described, but can be acquired with practice in a short time.

The stem of the ivy at the bottom part of the bracket is quite thick; there are three branches and two forks. Now here is a capital opportunity for the exercise of good taste. The stem will look very well if merely rounded and then tooled as above described with the V-tool or with the tooling-gouge, but, as I said before, it will look much better, more natural, and more effective, if, instead of merely rounding the stem, you make some hollows in it, from the two forks of the branches; for instance, make them deep, and let them

run off to nothing, then round off the space between, which will then become a continuation of the branch, or, I should say, the origin or spring of the branch. If this is tooled neatly and in a varied manner, the effect will be excellent; the other part of the stem can be varied by knobs, or hollows, as your fancy dictates. But I should strongly advise my readers to purchase a really well-executed specimen of stem and foliage, carved by some Swiss or German artist. A study of this, after the little I have written about it, would teach my readers more in ten minutes than pages of further and more minute description. Now, having done all this, the next thing is to make the support to the shelf; here is



the pattern. You see it is just a repetition of one side of the lower part of the bracket, and you will, of course, trace it off from your enlarged copy. This support has to be carved on both sides, as it is seen from both sides. If you carve both sides of the support in the same way, the greatest care must be taken not to cut too deep, for fear of cutting through in some deep parts, as I once did. I had taken great pains with the bracket, and was doing my best with the support, as I intended it for a present, when all at once I found that I had carved a hole in the leaf. It was a very annoying, but at the same time a very fortunate, accident, for it taught me two things: the first was to keep my thoughts on my work and not to let them go wandering on to other things; the second, was a much better plan of carving both sides of the support. Now it is very evident that if both sides of the support are to be carved alike, the hollow parts of the leaf must be very shallow, which looks

poor and tame, or the wood must be thicker, which is still worse, for in some places you would have a thick edge to meet the eye, which is very ugly, and if this thick edge is divided by a deep cut, and each part sloped off to the edge of the leaf, so as to represent two leaves, laid back to back, it is very little better. The plan I adopted was to carve one side of the leaf to represent the upper surface, and then to carve the other side to represent the under surface. In this way, it is very evident that it is utterly impossible to carve through, for this simple reason, that where there is a hollow in the upper side there must be a corresponding rise in the under, and as the leaf must be brought to a fine edge all round, that is, where it meets the eye, it looks light and elegant. But it must be remembered, that all the veins on the lower surface must be raised veins, not incised, and this is the only troublesome part about it. I should advise my young friends to rough out the shape of the under surface, and then sketch the veins with a pencil, before cutting them. The leaf must not be cut too thin, but sufficient substance must be left in the middle to make a firm support. As the beauty of the under side depends mainly on the way in which the raised veins are carved, I should advise my young friends to practise assiduously at it, and try to carve not only simple raised veins, but also branching veins, as seen on the under surface of many natural leaves. I can promise them that their trouble will be well rewarded, not only by the more finished artistic appearance of the bracket, but by greatly increased skill of hand; and it must be borne in mind that, as each difficulty is overcome, greater power is acquired for overcoming other difficulties.

When all the leaves of the bracket and support are carved, and made as smooth as you can get them with your tools,

you must proceed to finish them with sand or glass-paper, first with a moderately coarse glass-paper, then with a finer. The sheet of glass-paper can be divided into quarters, and again subdivided into pieces of a convenient size. Take one of these, fold into a little pad, fitting the leaf, and work with this, exposing a fresh portion of the paper, as each in succession gets worn. When the proper degree of smoothness is nearly attained, little bits of the glass-paper can be torn off and put under the finger and worked in that way. But whatever plan you adopt be most careful not to round off the edges of the leaves, for this gives the work a heavy, dull clumsy appearance. When the leaves have been smoothed with coarse and fine glass-paper, brush each leaf well with a clean, hard, bristle brush, and then take the V-tool and incise the intended veins. The brush will remove all particles of sand or glass that might otherwise blunt the tools. The veins could not be incised before, because the sand-paper would rub down the sharp edges of the veins, and totally spoil the effect.

I must here warn my young readers that no wood-carver of any pretension to skill ever uses sand-paper to finish his leaves; it is utterly inadmissible. By a nice adaptation of the sweep of the gouges to the shape of the leaves, and by going carefully over them, he can produce a perfectly smooth surface without that dead appearance caused by the use of sand-paper. I would advise all my readers to trust solely to gouge and chisel. Their work will look a little rough at first, but it will very soon acquire the requisite smoothness.

I used glass-paper as here described, when I first began to carve on wood, but soon left it off, and found that the leaves, although not quite so smooth, had a more natural appearance.

The Swiss carvers use it to save time, and vein their leaves afterwards.

Instead of glass-paper for the final polishing, I generally use glass-cloth, No. o. For smoothing the inside of a very hollow leaf, or any place difficult to get at, or for rounding off a branch or stem, I cut the cloth into strips a quarter of an inch, or three-eighths wide, laying the sheet of glass-cloth glass downwards on a flat piece of board kept on purpose, and putting over it another, planed to a smooth edge to guide the knife.

Then I take one of these strips, put it down on the spot to be smoothed, and the first finger of my left hand slightly pressing the slip down, I pull it towards me with my right hand, and in a few strokes the part is perfectly smoothed. Then these narrow strips put over a branch, or any part to be rounded, and worked backwards and forwards, soon effect the purpose, and produce an evenness and polish that could not be so well effected by any other method. Glass-paper will not do so well to cut into strips; it breaks off short when any strain is put upon it, whereas the threads of the cloth hold well together, and the strip can be used until the glass is quite worn off.

The leaves of the bracket being now finished, the branches rounded and nicely tooled, you must now commence to back carve the whole; that is to say, to undercut the leaves, stems, and branches, so that no dead wood may meet the eye, for this dead wood has the effect of making the bracket or any foliage look heavy, very heavy indeed. So you must undercut each leaf and branch to an angle of sixty degrees, and no more; to undercut more would be a waste of time and labour, it would not produce a better effect, and the result would be disappointment. Take care that each

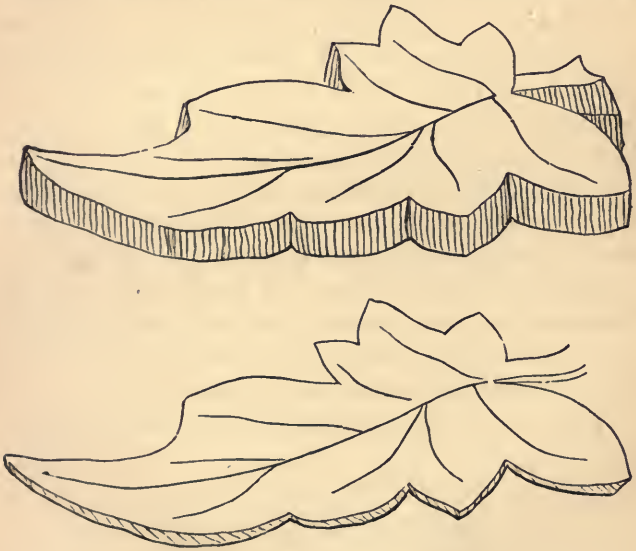
leaf is brought to a tolerably fine edge, but not so fine as to be easily chipped, and that the branches are back-carved, so as to show only the rounded part.

As a commencement, lay the bracket down on the bench, carved side upwards, take a half-round gouge and cut away the dead wood gradually downwards, from near the edge of any leaf, till you have cut it away to an angle of sixty degrees, get it pretty smooth with a flat gouge, and then turn the bracket over and work the place smooth with a flat gouge. This little place so carved will serve as a model by which to finish the rest. Having once back-carved a leaf or leaves, you will never again or very rarely require to begin from the front. Take care you clear out the angles and junctions of leaves, and that you do not leave any chips, rags, or fragments to be seen from the front, but get all as smooth and clean as possible.

Great care must be taken to avoid a fracture, where the point of a leaf is crossed by the grain of the wood. If the cut is made towards the point, you may be quite sure the point will be broken, for as the tool presses nearer and nearer to the point, the resisting power of the wood diminishes in proportion as it tapers off; but if the cut is made from the point towards the body of the leaf, it can be done in perfect safety. Whenever back-carving the point of a leaf across the grain in a piece of wood that is unusually brittle, I always turn the wood over, carved side uppermost; then inserting the tool at the extreme point, I cut down at once the angle of sixty degrees. This saves the point, and I finish back-carving as before described.

During the process of back-carving, turn the bracket round occasionally to see the effect produced; and to make sure that enough had been cut away at the angles, and that

no chips or rags are visible from the front. If a leaf or leaves are very much carved away, and there is not sufficient substance left to resist the unavoidable pressure required to force on the tool, and this very often occurs in the support to a bracket where both sides are carved, a pad of folded paper of sufficient thickness can be placed under the part to support it. This is better than a piece of wood, because the



paper will not chip or mark the carved part as a piece of wood might do. One of the best ways of forcing on a tool where the wood is too tough, or there is too much to be cut by simple pressure, is to drive it by smart blows with the palm of the hand; and this is the safest plan to adopt in any critical part, when a slip of the tool would cause much and irreparable damage. The blows can be regulated to a nicety,

and the impulse stops with the blows; whereas, when giving your weight to push on a tool, it is at times quite impossible to stop it instantaneously, and the tool may slip and cause great damage.

One illustration is worth ten pages of description; therefore, before quitting this part of my subject, I give an illustration of what I have advanced in respect to back-carving—a view of a leaf not back-carved, and a view of the same back-carved, as I recommend. The difference shown by even these rough sketches is, I think, sufficient to carry conviction to any mind. What a heavy appearance the dead wood at the edge gives to the first, and how light the second looks, where it is all carved away, and the leaf brought to a fine edge. I have not shaded the leaf to show any depth of the carving; it is quite unnecessary, as my sole object is to show what great lightness is given to the work by back-carving, and my readers from this sample may figure to themselves the great difference back-carving would produce on a mass of foliage. I can assure them the effect is marvellous, and will repay all the extra trouble it gives.

Here are two more small illustrations, showing the edge

Old Method.

of the leaf turned towards the spectator. The first is the leaf carved on both sides in the ordinary way. The carving is shallow, as a matter of course, because the wood is thin, and in consequence it looks poor and mean, as my readers would certainly say were they to get a front view of it. Seen in

this position edgeways, they can themselves judge of its appearance; and if a thicker piece of wood were used, and the carving made one half deeper, it would certainly improve the front view, but it would aggravate the unsightliness of the view edgeways.

Here is the second illustration, the same leaf carved on both sides, but in the way I recommend; one side to repre-

New Method.

sent the upper surface of the leaf, the other to represent the under surface, or back of the leaf; and I think there can be little doubt as to which looks the better, and which is the more artistic of the two. I have shown the under surface, that you may see how it is done, and how the leaf comes down to a fine edge. Bear in mind that, carve a leaf as deep as you please in this way, if the slightest care is taken, you are not likely to carve through and spoil your work.

To complete the bracket there now only remains to cut the shelf, and then to put the bracket together. The usual rule for the size of the shelf is to take half the extreme breadth of the bracket as a radius, to strike a semicircle on the wood for the shelf with this radius, and cut it out accordingly. This is the simplest and easiest form, and the edge of the shelf can be nicely rounded with rasp and file, then smoothed with sand-paper and polished. But it adds greatly to the effect when the edge is cut into scallops instead of plain round. To do this take your compasses, put on a pencil point, and with it strike the semicircle as above directed, then at half an inch outside this strike another semicircle. Now take a penny out of your pocket, lay it just

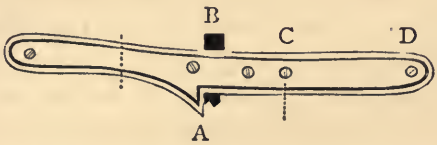
inside the outer circle, run your pencil round the penny between the two semicircles, push the penny along, and run the pencil round it again, taking care that the marks round the penny only just touch, they must neither overlap nor separate. Continue this right through, and your shelf will be perfectly and neatly marked off into scallops, and it can be cut out at the sawing table.

A pencil point must be used in drawing the inner semicircle, because the compass point would leave a deep score across the base of each scallop. If the scallop as marked by the penny is too large, take a halfpenny, or a shilling.

But perhaps my readers have no compasses; no matter, we can do quite well without them, we only want a strip of paper, a stout pin or brad, and a piece of fine twine. Take the strip of paper, cut it to the exact measure, lengthways, of the extreme breadth or T of the bracket, fold it in half, this half will be the exact radius. Take your pencil, and draw a line as close to the edge of the board for the shelf as you can get it, measure off on this line the radius of folded paper, and mark the two extremities. Stick the pin at the inner point marked, this will be the centre, now take a piece of fine twine, make a loop in it, this is to guide the pencil, put the pencil point into the loop, which must be quite down on the board, place the point on the pencil line at the outer mark, tighten the twine and twist it two or three times round the pin. Now run the point along; the loop will hold and guide it, and you will have a nearly perfect semicircle, it will only vary from a true semicircle by the breadth of the pin.

There is another way of ornamenting the edge of the shelf which is very effective; this is by bevelling off the shelf from above, meeting it with a small bevel from below, and then making a succession of gougings across the bevel all

the way round. If this is neatly executed it looks very well, the bevel is, in fact, fluted all round. A moulding may also be made all round the shelf by means of different gouges. There is also a little instrument, of the nature of a plane, used by French carvers to assist in making their mouldings; it is called a "Tarabiscot." English carvers make all such tools themselves; in Paris they are sold at the tool shops. I annex an illustration.



The tool is eleven inches long, an inch deep at the ends an inch and a half at the shoulder, A, and an inch thick. It is made of two pieces of wood screwed together by four screws. The plane iron goes in between the two centre screws. Carvers always make the plane-irons themselves. B is the iron.

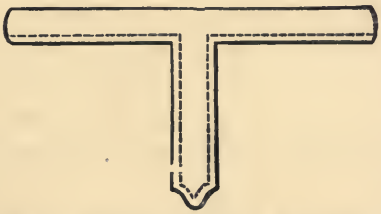
Now, suppose it is required to make a moulding round the shelf of the bracket, and the young amateur has made one of these tools; he must now procure a bit of ribbon-steel, soften it in the fire, cut off two lengths of one and a half inch each, put them together, mark on one the shape of the required moulding, and file it out with the rat's-tail or other files. When he has got the proper shape, he must temper and then sharpen the irons, one one way, the other contrary, so as to cut both forwards and backwards, on account of the grain of the wood.

Thus, the moulding having been roughed out, the shoulder of the plane is placed against the lower part of the shelf, and the iron run along the roughly-cut moulding.

The iron scrapes it. When he has cut sufficiently one way, he must shift the iron for the other, cutting the contrary way; but it is better to make a pair of these tools, to avoid shifting.

I have also seen a better form of the tool. It is made out of one solid piece, which is drawn down to the dotted line half-way down the handle; then at C, a long large screw is put quite through into a wooden button on the farther side. Turn this button, and the plane iron is loosed at once, when the screw at the shoulders is slightly loosed. There is no screw at D. The pattern here given is of the tool as it is sold in Paris.

Now there only remains to put the bracket together. If it is to be screwed permanently together this is soon done.



If it is to fold up with hinges, which is very convenient for putting away, it will be a longer process. But before putting together there is one neat little finish I should like you to give to the bracket, that is, to make a little reed round the uncarved or T part of the bracket and the support. So take your rule or a piece of board planed to a straight edge, and with your tracing point draw a neat clear line one-eighth of an inch from the edge of the T, and the same on the support, as shown by the dots. Then with the V tool deepen this line, then round off the outer edge of the cut, and the edge of the bracket also, and this will form a neat reed, and give a pretty finish to your work. Now see where you had better put in

the screws, they must go into the support where there is most wood to hold them; then see whereabouts to put them through the upright part or T of the bracket. When you have decided where to put them into the support, lay it down on the T, and mark the exact spot where they will go through; see that the marks are exactly in the centre of the T, not too much to the right or left, and bore the holes.

The shelf should be exactly on the level with the upper edge of the T; so leave room for it. When the support is screwed on, lay the shelf on the top, and bore the hole for the centre screw, which should be put over the support. If the bracket is large, you will have to put in two more to the right, and two more to the left; if the bracket is small, then three screws will suffice for the shelf; if it is desired to make the bracket fold, then four small hinges must be provided, and sixteen small screws. The first hinge must be put on one inch, or thereabouts, according to the size of the bracket, from the top of the support, and, as it must be let in, a place must be cut for it, so that it may be flush or level with the wood. The second hinge should be at the same distance from the bottom of the support. Now, when this is done, lay the bracket down on the bench, and place the support on the T in the position it is to retain, and with the tracing point mark very exactly the position of the hinges. Now take the hinges off the support, and with chisels suitable to the size, let them in neatly. The holes in the hinges ought to be properly rymed out, so as to be quite large enough to admit the screws, and counter-sunk so that the screw-head may come level with the metal. If they are not, the rymer*

* A rymer is a long piece of steel, quadrangular, and tapering off to a point. This is put into the screw-hole, and on being turned round the sharp angles of the steel enlarge the holes. A rose-bit is a conical piece of

and rose-bit must be purchased, for you will have constant use for them whenever you have to put on hinges, or to let in screws. The shelf must be put on in the same manner as the support, the hinges being let in neatly and carefully, each part of the hinge level with the wood.

The only thing now remaining to be done is to drive a retaining-pin into the upper edge of the support, on which the shelf rests. Three-quarters of an inch of stout hairpin is as good as anything. Bore a little hole for the pin about one inch from the end of the support, where the branch is joined to it, and drive in the pin lightly. Now press the shelf down on it, and where the pin makes a mark bore a hole for it. This pin keeps the support in its proper place, and prevents it from shifting.

Now rub over the whole bracket with your hard bristle brush, and beeswax and turpentine, and it will be finished. But if you wish to polish the bracket nicely, rub it well before putting it together. It can be laid on the bench and well rubbed with more convenience, and a really good polish produced.

steel, cut into a coarse file, and used for sloping off the edges of the screw-holes, so that the screw-head may not project above the metal. There is another kind of rose-bit for wood-work.

CHAPTER VII.

THE young amateur wood-carver who has followed my instructions, has kept his wits about him, and has worked diligently and energetically, and with a determination to excel in the beautiful art of fret cutting and wood carving, will have frequently felt himself greatly impeded by having to wait the leisure or convenience, or to depend on the good nature, of the neighbouring carpenter to dress his wood for him, or he will have felt in the high price he has had to pay at the tool-shop for ready-prepared wood a burthen on his pocket-money he would gladly be spared.

The price that tool-sellers charge for ready-prepared wood is not to be wondered at, although it costs about a third more than unprepared wood bought at the timber-yard, and nearly a fourth more than unprepared wood bought at the tool-shop. It must be remembered that the tool-seller has to pay the workman for dressing the wood, and also to make a profit on his outlay; and these two items, workmen's wages and profit on outlay, necessarily run up the price.

Almost every amateur wood carver, I repeat, must feel the annoyance of one of these two impediments—the time lost in waiting the leisure of the neighbouring carpenter, or the high price of prepared wood purchased at the tool-shop. The high price of the wood is serious, but the loss of time is

more serious still; therefore, I should advise every one who can afford it, or who can little by little save up the money, to buy a few carpenter's tools, and to begin with a couple or three saws, a dovetail saw, a common hand-saw, and a half-ripper—this last is the least necessary to the beginner; and two planes, a jack-plane and a smoothing-plane; and, having procured these tools, to become as soon as possible their own carpenter, and dress their own wood.

To enable young amateurs to do so, and with a view to their eventually becoming their own joiners, I purpose in this chapter to give them some instruction on the nature of the tools named, and how to use them.

I have no intention to enter on the subject of joinery; this would require quite a treatise to itself, and is beyond the scope and intention of this work; but whoever can learn to handle these two tools—saw and plane—efficiently, he will have mastered the principal part of the groundwork of carpentry and joinery. To saw straight and plane true may be called the groundwork and foundation of carpentry.

Looking at a carpenter planing a piece of wood, the operation seems easy enough; but to plane a piece of wood true and without "winding," is not so easy as it seems—it requires considerable skill.

We will begin with the saw, the first tool in the order of importance. Of this tool there are many kinds, each adapted to a different operation; but we will deal only with the three before named.

The common hand-saw is used for cutting across grain; it is generally twenty inches long in the blade; it has eight teeth to the inch, and fines off from the teeth to the back. The teeth of all saws are bent alternately to right and left. This is called the set of the saw; without this set the saw

would not pass freely through the kerf or cut, the fibre would close in and jam it; but the teeth being thus set right and left, the space they cut is doubled, and as the blade of the saw fines off, as before mentioned, from teeth to back, it passes freely through the cut.

When the teeth of large saws are set wide for sawing large timber into planks, I have seen them on the continent set in groups of three—one tooth right and left, and the third remains in its original position, upright, the saws were thought to cut quicker by this set.

Saws should be made of the finest steel, and be so thoroughly well-tempered that, if bent nearly to a right angle, they should spring back true to their original position, and in choosing a saw its temper should be thus tested.

There was, many years ago, a firm at Chelsea, Howell and Co., celebrated for their saws. I have seen a carpenter take one of Howell's saws, bend the point through the handle, and let it spring back; it came as straight and true as a line.

The natives of all such Oriental countries as I have seen, reverse the teeth of their saws and point them towards the handle. From this it results that the motion required is a pulling motion; the teeth of our saws point away from the handle, consequently the motion required is a pushing motion. I have tried both, and prefer our own method, as infinitely more powerful and expeditious. But time with an Oriental is comparatively of little value, and the pulling motion suits their habit of working, which is, squatted on their heels on the ground.

Now we will suppose that the amateur wishes to saw off a portion of a board, and that the line the saw is to cut is marked across it. Now the way to use the saw is not to grasp the handle with the right hand, to place the left hand

on the back of the saw, and applying the teeth to the edge of the board on the marked line, to make a dash and a dig at it, as I have seen more than one amateur do. This proceeding makes a gash on the edge of the board, mangles it frightfully, tearing out large splinters, and it is ten to one if the marked line is hit, and then the edge of the board has to be haggled about until the saw fairly enters on the line.

Proceed in this way: Place the board or plank on a sawing trestle, or old box or packing-case, of a suitable height, put your left knee on it to steady and keep it firm, then grasp the edge of the board with the fingers of the left hand, at an inch and half or any convenient distance from the marked line. Now raise the thumb of the left hand, to form a guide to the saw, grasp the saw firmly by the handle, and placing the blade against the guiding thumb, apply the teeth very lightly to the edge of the plank at the mark so lightly as just to merely scratch it; make three or four short, quick strokes, each as light as possible, until the saw has fairly entered the board on the line; then lengthen the strokes gradually, and saw with long, regular strokes.

Do not press the teeth of the saw downwards into the wood when propelling the saw forward, but let the saw cut by its own weight. This will be quite sufficient, and if the amateur saws steadily, and not by fits and starts—first two or three short, hurried strokes, then two or three long ones—he will soon make good work.

If my young readers will follow strictly the advice just given, they will soon be able to enter a board with a single stroke of the saw. Use the full length of the saw, draw it back to within two inches of the point, and propel it forward as far as the handle will permit. If the wood is hard or

tough, a little grease applied to the teeth will greatly facilitate the sawing.

When a plank or piece of wood is nearly sawn through, the operator must take the precaution to support the portion being cut off, either with his left hand or by putting something under it, or it will break off by its own weight, and splinter one or the other part.

We will now suppose that the amateur desires to saw with, instead of across, the grain of the wood, and to split a piece of board, say an inch and half thick, sawing through both edges, so as to make two boards of the same superfices. The board must be dressed along both edges, and on the top also; then with a gauge mark a line for the saw carefully on the dressed edges and top, and place it nearly upright, but at a convenient angle, in the bench vice. Take the half-ripper saw; this is a little longer than the hand-saw, and with larger teeth; enter the saw most carefully at the upper angle of the board, with very light and short strokes; cut through to the further edge of the board, then turn it round and cut from what was the further edge, and so on alternately; and if done carefully this will make both halves come as even as possible. Success mainly depends on entering the saw evenly on the lines at top and edge.

This is one of the most difficult of all sawing operations, and especially difficult to a beginner; it requires the greatest care, or the board will be divided unevenly and one or both halves be spoiled.

I may here remark that the beginner should pay great attention to his position in sawing. If the work is too much in front of him, I may say too far over to the left, the saw will be apt to incline from right to left; or if the work is too far over to the right the saw will be apt to incline from left to

right. In either case the cut or kerf will not be perpendicular to the surface of the plank. The line marked for the saw should be exactly opposite the right shoulder, and the eye should look down both sides of the saw.

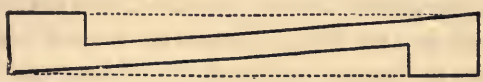
If it is desired to divide a plank lengthways, to cut off a piece the whole length or part of the length, enter the saw with the caution before described, and as soon as it has cut into the plank sufficiently to feel the pressure of the wood closing in upon it, insert a little wedge into the kerf to keep it open, and this will greatly facilitate the sawing.

The last saw to be described is the dove-tail saw. This is a very fine-toothed saw, of about eighteen teeth to the inch, and a very useful saw to the wood-carver. The blade is very thin and broad, and is let into a brass or steel back to keep it rigid. It will be seen at once from this arrangement that this saw is not intended for cutting through any thickness of wood; the back would prevent it. This saw requires great care in using, to prevent it from buckling, getting bent or strained. If by any accident the saw should get bent, a tap or two, given lightly on the back, just over the bent part, will frequently put it right.

There are two very efficient aids to the saw, simple and inexpensive, but indispensable, the use of which I will now describe. The first is the bench saddle. This can be made by the amateur himself. It is a piece of wood with reverse shoulders; the under shoulder hooks against the side of the bench, the shank or body lying on the bench, the upper shoulder catches any piece of wood laid against it for sawing.

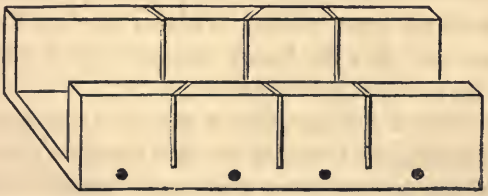
It is made in this way:—Take a piece of any wood, hard deal as good as any, fifteen inches long, one and a half inches thick, two inches wide, and at two inches from each end, but opposite sides, make a cut across two-thirds through; then

turn the piece of wood on its side, and from the angle formed by the surface, and the further end, draw a line diagonally down to the bottom of the cross-cut. Take the piece out; do the same on the other side, and the pieces left untouched at each side form the shoulders. Here is a sketch to render the description intelligible.



With the help of two of these saddles any plank or piece of wood, if not too large, can be held firmly in the bench for sawing.

The second aid to the saw is the mitre-box. This is more expensive, and will cost half-a-crown at the tool-shop; it is a small trough of wood, open at each end, and of any size, according to circumstances. In both walls of this trough are two saw kerfs at an angle of forty-five; the lines



of these kerfs cross each other at a right angle. There is also in each wall one kerf at right angles. The dovetail saw runs in these kerfs, and so, without failing, with little trouble, and no loss of time, a piece of wood laid in this trough can be cut to a true angle of forty-five, or to a true right angle. Two pieces of wood cut to an angle of forty-five, when the joints are joined together, form a mitre joint and a true right angle. This joint is much used for small boxes, picture-

frames, and such like work, and it is the most simple of all joints. I give a sketch of the mitre-box.

Every one who learns to use the saw should learn how to sharpen it; the workman who depends on another man for sharpening his tools is only half a workman—he is a poor, dependent, helpless creature.

Take the half-rip saw and look at it, turn the teeth up, and it will be seen that not only is the point of each tooth sharp, but the front of each tooth also is brought to a sharp cutting edge. Now take two boards, each eight inches wide, one inch thick, twelve inches long, put them together, and stand them up, then let the upper and outer edges of these boards be bevelled off, then let the inside surfaces from an inch below the upper edge to the same distance from the lower edge be cut away, say to the depth of one-eighth of an inch each, put an iron screw and nut loosely through the lower part of the boards just to hold them together; put the saw between the boards, the teeth projecting a quarter of an inch above the upper bevelled-off edges; then put the boards with the saw into the bench vice, and with a turn of the screw the saw will be firmly fixed.

To sharpen the saw, take a triangular file, three-square file it is called, the handle in the right hand, the point of the file between the thumb and forefinger of the left hand, apply it to the front of the first tooth that leans away from the operator. Let the point of the file incline towards the point of the saw, give three or four or more rubs of the file, and the point of the tooth will be sharpened, and the front brought to a sharp edge, and as the file will have passed over the top of the next tooth it also will be filed down, and the point partly sharpened.

Now apply the file to the front of this tooth; it leans

towards the operator, so the point of the file must incline towards the handle of the saw. Give, as before, three or four rubs, according to the state of the saw, and the point of this tooth will also be sharpened, and its front brought to a sharp, cutting edge. Go on in this way alternately, always remembering that when the tooth leans away from the operator the point of the file must incline to the point of the saw, and when the tooth leans towards the operator, then it must incline towards the handle of the saw.

If the saw has been sharpened before, it will be advisable to first run the file along the top of the teeth, to bring them all to a level.

I give a profile of the saw clip just described :—

The tool that comes next to the saw in point of importance to the carpenter and joiner is the plane. There is no tool that has so many varieties or that assumes so many shapes; but we have to consider only two—the jack-plane and the smoothing-plane. These two will be quite enough for the amateur to commence with, but as he progresses and begins to joiner his own work he will require others; but whoever can learn to handle thoroughly and efficiently these two planes, will require very little teaching to use any others.

The plane is composed of two parts—the stock and the plane-iron, or blade; a plane is, in fact, neither more nor less than a chisel, set in a handle or frame to guide and control it. Indeed, on the continent, I have seen a carver use a chisel in this way to level the ground of a pattern he was carving in the solid.

The jack-plane is about fifteen inches long, and two, or two and a quarter inches wide. The handle is called a toat or horn. The irons of jack, trying, and jointer-planes are usually double, an upper-iron being screwed on to the lower one to turn the shaving back a little, and so make a cleaner cut. These upper-irons can be shifted up or down as required. Some jack-planes are made with single irons, for planing outsides or rough work. They work easier, and are more quickly sharpened, as there is no upper-iron to unscrew and replace,

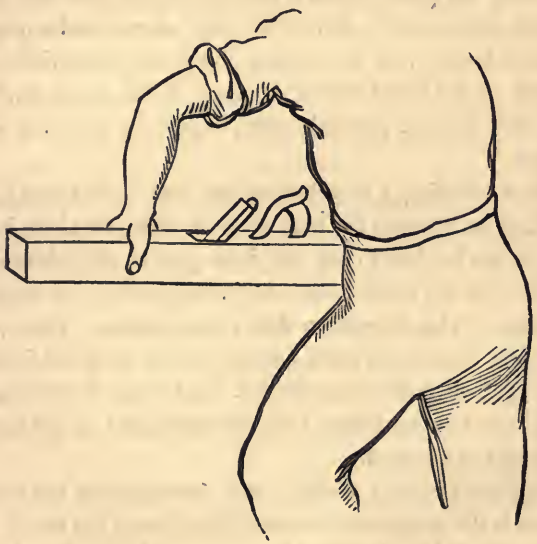
The first thing to learn is how to sharpen the plane-iron, and, in order to do this, to learn to get it out of the "stock." Take the plane in the left hand by the middle, the thumb in the plane mouth; then with a mallet hit two or three sharp strokes on the top of the plane in front; this loosens the wedge, and the iron comes out easily. Never hit the plane with a hammer if you have a mallet or heavy piece of wood at hand; the hammer dents the wood deeply. Always remember the carpenter's old rule, "Wood to wood, iron to iron," and never hit a wooden tool or handle with an iron one, or an iron tool with a wooden one; the wood always "comes to grief." Remember this is a carpenter's adage, not a stonemason's.

Having got out the plane-iron, lay it on the bench, and unscrew the upper-iron, and proceed to sharpen the plane-iron, as directed in my first chapter (page 6), taking care, before commencing, that there is not the smallest particle of grit on the stone.

When screwing on the upper-iron, remember that the farther it is from the edge of the plane-iron the easier the plane will work, but the cut will be more rough, the wood more likely to be torn; the lower down or nearer the edge

of the plane-iron, the harder the plane will work, but then the cut will be cleaner.

Replace the iron in the stock, and holding it in position with the thumb of the left hand, drive in the wedge, but don't drive it in too hard, as it will "spring" the plane-iron, and make it concave, when, of course, it will not plane true, or, as I have known it do, it may spring the upper-iron, so that shavings get in between the two, and constantly choke the



plane. If on driving in the wedge the plane-iron projects too far, give a tap with the mallet on the hinder end of the plane, and this will send it back. If it does not project enough, give the top of the iron a tap or two with a hammer until it is set as required.

The very foundation of all good carpentry is planing the

stuff true; therefore make every endeavour to learn to plane a board true and without winding. A board is said to wind or wynd, when the two opposite corners—that is, the left-hand nearest corner and right-hand furthest corner—are lower than the other two.

Place the board firmly on the bench against the stop or dog, which must be knocked up to a proper height; then, to prevent the board from shifting or drawing back with the motion of the plane, fasten it down with the holdfast, or, as English carpenters do, drive a bit—say an inch and a quarter of an old knife—into the bench, and at the same time into the end of the board below the level of the upper surface. This will keep it perfectly firm; but it is a clumsy contrivance.

Now, standing a little behind the end of the board, put the plane on it, grasp the toat or horn with the right hand, and put the left hand over the front part of the plane—the knuckles on the further side, the thumb on the side next the workman. The illustration shows the position. Then push the plane smartly forward, taking care to keep the front of the plane well down with the left hand when beginning the stroke, but bearing harder with the right hand on the handle at the end of the stroke.

Beginners always reverse these motions, and the consequence is the nearest corner gets planed away too much, and the board winds. As the planing proceeds, lay the edge of the plane-stock occasionally across the board in various parts, and the light coming under it will show at once whether the board is planed evenly, or whether in any part it is cut away too much or not enough.

When the board has been planed all over and the two edges dressed, take up the board, and holding it across the

body, raise the nearest edge, look over it, and bring the lower edge as nearly as possible in a line with it, and it will at once be seen if the board is planed true or if it winds.

When one surface has been planed true, take a marking gauge, set it to the thickness the board is required, run a line with it along the edges of the board, plane to this line, and if the surface first planed was true, the whole board will now be true.

The marking gauge is composed of two pieces, the gauge block, through which passes the bar or strig on which is fixed the iron point that marks the work.

To hold the gauge properly, the third, fourth, and fifth fingers of the right hand should grasp the strig just behind the gauge-block, the forefinger should be on the gauge-block, and the thumb on the fore part of the strig, just by the marker.

When a board is being planed, it may very well be reversed, that is, turned end for end, to suit the grain or the convenience of the workman.

The smoothing-plane is held in a different way from the jack-plane. The board having been planed down and got true by the jack, the smoothing-plane is merely used, as its name denotes, to smooth any roughness left by the jack. I may here remark, that, to plane true any long piece of board, a longer plane, called a trying-plane, would be required; the jack would not be sufficient.

The smoothing-plane must be set very fine, and the upper iron should come quite low down towards the edge, according to the fineness of the shaving to be taken off.

The heel of the smoothing-plane is held in the right hand, fingers on the off-side, thumb on the top of the plane, or next the workman; the left hand grasps the front of the plane in a similar manner.

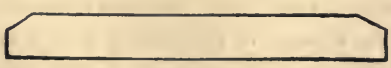
The plane is then worked backwards and forwards over the board, or with a circular motion, until the board is perfectly smoothed.

To take out the iron, for the purpose of sharpening, hit a smart blow or two on the heel of the plane; this will loosen the wedge, and the irons will come out.

In grinding plane-irons, be careful not to make the bevel too long, for if too long the iron may quiver and produce uneven work.

Plane with the grain of the wood whenever possible, turning the board end for end when necessary. But in some cases it will be found desirable to plane across the grain, particularly all hard, close-grained woods. I am not aware if this plan is adopted by English carpenters, but I got the first notion of it when watching the native carpenters in India, and seeing how quickly and with what ease, with their rough, imperfect tools, they reduced a plank of very hard wood by cutting across the grain.

Now, suppose a hard bit of oak or walnut has to be reduced from seven-eighths to five and a half. To plane it down in the ordinary way is a hard, tough job; so try my plan, and proceed thus: Smooth one side quite true, and square the edges, then take a marking-gauge and mark off the required thickness all round; then with the plane bevel off both edges nearly down to the gauge-mark. A section through the board will then have this appearance:—



Place the board across the bench, and against the dog, fastening it down with the holdfast. Now begin and plane across the grain, and it will be found that the plane will take

the wood down quite easily and very rapidly. As the board is planed push it along, and so plane the whole length gradually, turning it round when necessary.

The reason why I advise the edges to be bevelled off is, that if not bevelled off, when the plane side comes to the edge it is likely to splinter it; when bevelled of course it cannot. Turn up the edge of the board as before directed, to see if it is being planed true, and use the plane accordingly. Of course when planed in this way, the board is very rough; but when the board has been cut down to near the gauge-line, turn it endways, and plane with the grain in the usual manner.

I think these few hints for handling the saw and plane will be acceptable to my young readers, and all that is necessary to enable them to prepare their own wood; and we can now proceed to the consideration of carving, in the solid.

CHAPTER VIII.

I PROMISED in my last chapter to give one instance, out of many I have witnessed, of the ingenious way in which the natives of India produce great results by small and simple means—I might have said with great and perfect truth, innumerable, instead of many ingenious ways; for the natives of India are rarely at a loss for expedients, and much of what they have accomplished, and still do accomplish, seems to us the more extraordinary, because all is done without any of the machinery or appliances to which we are accustomed.

During the time I was at Agra, a friend gave me some very beautiful transparencies he had received from England. I was most anxious to mount one of these in a frame to stand in front of a door leading to the private apartments, so as to cut off all view into the apartments, yet allow the door to be left open for that free circulation of air so necessary to health and comfort in India. I borrowed from a neighbour a very handsome frame such as I desired to have, that had been turned and made up by an English workman in Calcutta, and I hoped to get a feeble imitation of it; so I bought the necessary wood, and sent to the Cotwal of the Bazar for a turner. Cotwal is the head of the police of the Bazar, and in fact the governor.

In two or three days two men walked up to my house,

one of them with a frail, a carpenter's basket—and not a very large one either—over his shoulder.

"Who are you?" I asked.

"Huzzoor, your Highness," replied the foremost of the two; "I am the turner."

"Well, when can you do my work?"

"Hazzoor, tyar hoon. I am ready to do it."

"But where are your implements?"

"Oh, I have everything here."

With a "considerable of a stare," as our Yankee friends say, I looked at the man, who very coolly walked up to a large shady tree, made his man put down the basket, selected a spot, gave the man orders to clear away the leaves, and then came and asked me what he was to turn. I showed him the wood and the pattern frame; he gave a nod of approval.

"Can you make me a frame like that?"

"Oh yes, there is no difficulty in it." I stared again. "But your highness must tell your tent-pitcher to give me two long tent pins and two short ones."

These were soon given, and as I saw the man was intent on business, I deferred my own, and went out to watch his proceedings.

Squatting on the ground, he first took out of his basket what may be called the national implement; it is a short bladed adze, with a thick, heavy head, weighing from three to four pounds; with two cuts of this implement he made a small flat space at the side of the head of each tent pin. Then he took out a couple of old thick nails and a hammer, laid his adze down on its side, and making use of the head as an anvil, gave the nails two or three blows each, to knock them into the desired shape, then out of his basket he took a drill and bow, which were just a long stick with a

thick bit of twine fastened to one end, and with this he drilled holes in the flat place he had cut in the pins. Into these holes he drove the nails, leaving about an inch sticking out, and with a roughly-made file he soon brought these to a point.

Then he got the tent-pitcher to drive one of these pins upright into the ground to within eight inches of the head. Taking one of the pieces of wood to be turned, he cut off the proper length, laid it on the ground with the end just touching the pin, and at the extremity of the wood he made the tent-pitcher drive in the other pin. As soon as this was done, he cut the two smaller pins into the shape of wedges, then he took the wood to be turned, chopped it into shape with his adze, centered the two ends, made at the intersecting points a small hole, applied one hole to the nail point in one pin, and gave a little shove with the wood until he could get the other end of the wood on to the other nail point. When the wood was thus suspended on the nail points, he took the two wedges and drove them in the ground at the back of the tent pins until they were firmly wedged up. Then he tried if the wood could turn properly and freely, and as soon as he was satisfied on this point, he again put his hand into his basket and pulled out a bit of board of very hard wood, about a foot long, an inch thick, and eight inches deep, with a square hole in the middle; into the hole he inserted a piece of wood two inches wide and a foot long, fitted in such a way that it sloped downwards.

The edge of this board he placed against the wood to be turned, the end of the fitted piece he put down on the ground, placed his left foot upon it to keep it steady in position, and there was the rest for his tools.

Then diving his hand once more into his basket, he took

out a long narrow leathern strap; twisting this twice round the wood to be turned, he threw the ends to his mate, who immediately began to turn the wood round backwards and forwards with long, regular strokes, and the lathe was complete and in perfect working order.

The turner now took out of his basket a rough pair of compasses, a bit of an English pencil, then a rough pair of callippers. Putting the pattern beside him, he carefully measured off and marked the different parts on the wood to be turned. As soon as this was done, he once more dived his hand into his basket and brought out two or three chisels and gouges, and a piece of fine sandstone.

Taking one of the gouges in his hand, he gave a look at the pattern, then at the gouge, and as the sweep did not seem to please him, he put it down on the head of his adze and began to hammer it to the shape required; this was soon done, he then filed the inside smooth, ground the gouge by rubbing it on the bit of sandstone, and finished it on a bit of some smoother stone. All being ready, he gave the word to his man, who began to turn the wood round with the leather strap, and then applying the gouge he soon made the chips fly.

The man was evidently on his mettle, and whilst I stood by he finished a little bit of the most difficult part of the work. I went away to my own work perfectly satisfied with the man's capabilities; and I may conclude by saying that his work was quickly finished, and compared most favourably with the Calcutta pattern.

An English workman would look aghast if put down under a tree with a basket of tools and no lathe, and told to copy a nice piece of turnery work.

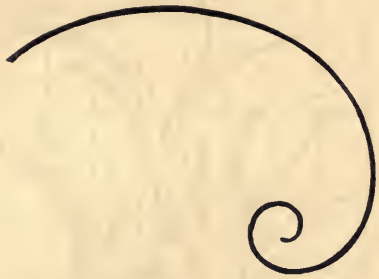
I tell my young friends this little anecdote as a fitting

introduction to this chapter on Carving in the solid, one of the higher branches of this beautiful art. I tell it that they may be encouraged to exercise their wits and ingenuity, and seek by simple means to overcome the many difficulties they must necessarily meet with. I address it more particularly to those who cannot afford or have not the opportunity to buy the numerous tools and appliances used by carvers to expedite their work.

And my advice to all my young readers who have not the advantage of taking lessons from an experienced carver is not to spend too much money in buying all at once a multiplicity of tools, but to buy a few at a time, and to learn thoroughly all that can be done with those tools. I cannot repeat this advice too often or urge it too strongly; they will learn more from an experienced carver in a few lessons than can be acquired by months of study from the best book or treatise that ever was or will be written. But if they have not this opportunity, then let them follow my instruction as closely and diligently as possible; keep their minds constantly on the alert, and never neglect any opportunity of inspecting and studying any piece of good carving that may fall in their way, endeavouring to find out from any tool marks that may be left how it was executed, and storing up in their minds, for future use, any noticeable peculiarity of design, of detail, or method of handling. A beginner, if gifted with even moderate powers of observation, will derive some information from any form of tolerable carving that chance may throw in his way.

In respect to what I have said above, to buy a few tools at a time as they are wanted, and to learn thoroughly all that can be done with those tools, here is something for my young readers to think over and experiment upon. Some people

would suppose that a set of gouges of the same sweep would make a perfect circle on a board if used in succession, each succeeding gouge (beginning with the largest) continuing the sweep marked by the preceding; but they would make a mistake, for instead of marking a circle, the set of gouges would mark a volute or figure of this sort :—



showing that the gouges, as they decrease in width, keep a proportionate depth, and that the smaller or narrower gouges of the set are not mere segments of the largest.

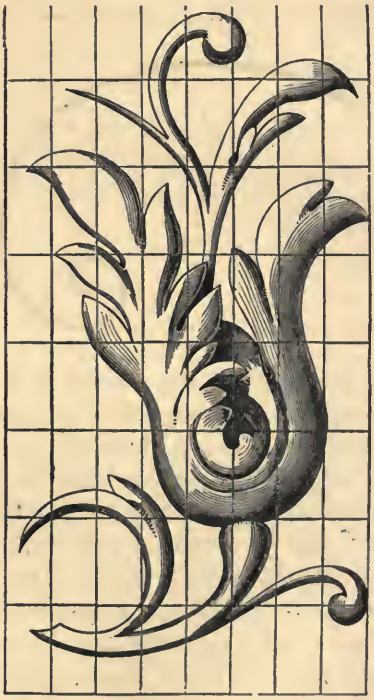
Take a set of gouges, stand the largest of the set edge upwards; put behind it the middle one of the set, and my meaning will at once be seen; my readers will find this a useful piece of information when they come to carve scrolls, and volutes, and leaves, diminishing proportionably in size.

However, any set of gouges will mark a series of circles one outside the other, the largest forming the outer circle, the next in size forming one inside it, and so in succession.

Now, without further preface, let us begin a piece of carving in the solid. I have selected a pretty but simple pattern, that will convey some useful lessons. I have drawn the squares over it, to enable my readers to enlarge it at once; if they find any difficulty in doing so, any of the

squares can be subdivided, and this will render it easy enough. I should recommend them to enlarge the pattern to double the size, so the squares must be enlarged accordingly.

When the pattern is enlarged, get a piece of walnut, or



pear-wood, or sycamore, or lime, or any piece of wood that will not split easily; it must be three-quarters of an inch thick when dressed and smooth.

Paste the pattern on, and when dry, take a marking gauge and run a line all round the edge at a quarter of an

inch from the bottom. Bore a hole at the back of the wood opposite to the spot where the leaf will be thickest, towards the bottom, and insert the carver's screw, taking care it does not run through far enough to be touched by the tools. Screw the work down to the table as tightly as possible, and fix it more firmly by means of pegs put into the holes in the table, and bits of wood inserted between the pegs and the work.

For the purpose of description, I will say that the leaf is divided into three main limbs, and that the upper limb is divided into two parts.

Now commence the grounding, that is, cutting away all the wood outside the leaf, and from the large interstices between the three limbs of the leaf, and from that which divides the upper limb.

And first of all take a gouge whose sweep will fit the curve of the leaf in the part it is intended to commence upon, and placing the edge of the gouge just outside, but quite close to the line, and holding the tool quite perpendicular, give it a moderate blow with the mallet. Take care not to drive the gouge in too deep, but begin gently.

Continue the process, and where the curve of the leaf alters, the gouge must be changed; but before changing, apply the same gouge to any part of the leaf its sweep will fit, and thus avoid too frequent changes and consequent loss of time. It will be a little puzzling at first to find the proper fitting gouge, but this disappears as hand and eye become familiarized with the work.

Do not cut into the smaller interstices or divisions of the leaf when sinking the ground, but cut outside of all, leaving the divisions for the finishing. For example, take the left-hand limb of the leaf: there are three points and two

interstices, cut just outside the three points; the interstices will, as I said before, be cut in the finishing.

Great care must be taken not to cut under the leaf, but let the cut be perfectly perpendicular. The reason for this is plain enough: if the leaf is undercut, then when it comes to be carved, its size and shape will be altered; and the deeper it is carved, the greater will be the alteration.

To cut down perpendicularly when grounding a piece of work, is a general rule; but there are many occasions when this rule must be set aside; and the cut, instead of being perpendicular, should slant outwards, away from the leaf, or whatever is being carved; and one of these occasions is when the carver has to outline or set-in the extremity of a finely-pointed leaf. If this leaf should be across the grain of the wood, the fine point would be certainly broken off if the gouge were held perpendicularly, and struck even a moderate blow with the mallet or palm of the hand. It is therefore much better and safer to slant the gouge outwards, thus widening the base of the leaf point, and giving it proportionate strength to resist the thrust of the tool. The extra wood at the base given by the sloping cut can be pared away afterwards, when the leaf comes to be carved.

Look at the fine slender point near the top of this leaf to the left; it would be impossible to cut down perpendicularly on each side without breaking it hopelessly; but with the cut sloping outwards, there can be no fear of breaking it, and the extra wood can be pared away afterwards in the finishing.

Now to sink the ground all round the leaf, take a flat gouge, small for the interstices, larger for the outside, and commence in this way: place the gouge at a little distance from the leaf, and by a sloping cut meet the perpendicular

cut already made; a section through the leaf will then have this appearance, the * * * showing the parts to be cut away.

With the gouge now cut down the wood, scooping it out gradually until it has been got down to the level of the perpendicular cut round the leaf. Whilst doing this pay attention to the grain of the wood, take care that the chips come out clean, and that the wood is not torn by cutting against the grain. It does not so much signify that the wood is torn if the ground has to be sunk deeper, except that it is quite as well to acquire a good habit. But when the ground has been sunk to nearly its proper depth, it is imperative that the wood should not be torn; therefore, in that case, if the grain dips away from the direction the gouge is cutting, and the wood tears, turn the wood or the gouge the other way, or cut across the grain, which in many cases is the easiest and most preferable way. Now repeat the whole process until the ground is sunk deep enough, going round the leaf with the perpendicular cut, meeting it with the sloping cut, and then clearing the wood away.

When the ground has been sunk to nearly its proper depth, great caution must be observed in two things: first, that the perpendicular cut does not go below the level of the ground; this leaves a very ugly, unworkmanlike look, that is always difficult, and in most instances impossible to eradicate, except by sinking the ground lower, which might spoil the whole work. A chance cut may be partly effaced by dropping a drop or two of water into the cut; this swells the wood, closes the cut, and renders it nearly invisible; but

if there are many such cuts, the eye would at once detect them, though it might pass over a chance one here and there.

The second thing to be cautious about is what I have already mentioned, and I repeat the caution in order to impress it firmly on the mind—to avoid tearing the wood when cutting against the grain; it may carry the ground too deep, and spoil the whole work; so in places where it is not possible to cut with the grain, and for fear of tearing the wood, it is not advisable to cut against it, cut across the grain, and at all times let the chips come out clean; they must not be torn or hacked out.

Before commencing to bost the leaf, look once more at the slender filament bending off to the left from the upper limb; it has been lowered in proportion as the ground has been sunk, and extra wood has been left; without these two precautions it would be most difficult to carve it successfully. It is a good example of an instance in which it is advisable to cut outside the line, to leave plenty of wood.

But I refer to this filament again because it serves to convey another useful lesson: in all cases where a slender curved branch or stalk of a leaf has to be carved across the grain, the cut must invariably be made first on the concave side, and for this there is a very good reason: if the wood is cut away first on the concave side, then the extra wood left on the other, or convex side, serves to resist the thrust of the tool; when the wood is afterwards cut away on the convex side, then the arched form of the stalk resists the thrust of the tool. But if the wood is first cut away on the convex side, there is nothing to resist the thrust of the tool when the concave side comes to be cut, and the arched stalk is likely to be burst through.

In all cases where the part to be carved is fine and delicate, plenty of wood must be left, and the extra thickness can be cut away in the finishing, little by little.

If plenty of wood is left there is something for the carver to work on, but if too much is cut away the shape of the leaf or branch will be spoiled.

As the ground is sunk, the whole of the upper limbs of the leaf should be lowered, and so also with the two delicate ornaments at the foot of the leaf to the right and left.

When the ground has been sunk to very nearly the proper depth, get it as level as possible with the proper tool—a very flat gouge (a very flat gouge is almost a chisel). The gauge line all round the edge will assist to guide the eye. The leaf must now be bosted, *ebauche*, as the French carvers term it, and commence with the left limb; and first with a half or quarter-round gouge reduce the wood until it assumes the shape of the mass of that side of the leaf. It will be seen that there is a hollow running down the centre, between the leaflets to the right and left, that it commences at the base of the top leaflet, and passes round to the back of the leaf at the third cross line from the bottom.

This hollow must be bosted, and when the general shape of this side has been attained, pass on to the other, and bost the whole in like manner, bringing out the general shape of the whole mass. Remember that in bosting, the points of the leaflets must be roughed out, but the interstices must be left for the finishing, and should be done when the leaflets are finally shaped.

The leaf having been bosted it must now be finished, so let my readers take pencil in hand, and, looking carefully at the design, let them sketch on the bosted mass each leaflet, division, and part, taking great pains to have all the

features correct. When this has been done—and too great pains cannot be taken to sketch on the features correctly—take a rather fine gouge, or the nearest to the sweep of the leaflets that the amateur possesses, and shape off the leaflets and cut the divisions between them. Take the upper leaflet to the left, and with the gouge in the left hand, enter it at the point and work down to the junction with the next leaflet.

In several of these leaflets the points, instead of being bent downwards turn up a little. This is done by raising the hand to enter the gouge at the point, and then, suddenly depressing the hand; this scoops out a little hollow, but it cannot be done unless the gouge is bevelled from the inside. In the renaissance and Louis Quatorze styles, almost all the points turn up a little, and they are done either in this way or with a cut of a hollow gouge across and just inside the point.

The limb and leaflets to the left being finished, the right hand limb must be attacked, and here care must be taken that the lower leaflet, which passes under the lower part of the left limb, is carried down deep enough, and that the covering portion of the left limb falls gracefully over it. The deep hollow at this lower leaflet is done with a fine hollow gouge, and the upper part, where the right leaflet dips under the left, is done with a fine quarter-round gouge, the pieces being picked out with a fine bent chisel.

The limbs to right and left having been finished, the upper limb must be carved. The round knob at the top must first be shaped with a half-round gouge—the neck should dip down quite low, and rise again towards the junction with the filament that goes off to the left. This filament tapers off from the stalk into an exceedingly fine

point. The best way to carve it will be with the left hand from the point to the stalk. Great care must be taken not to break the point; and I take this opportunity to inculcate this principle, that every care should be taken by beginners not to break or chip anything; and they should consider nothing well done in which there is a fracture. This will give them habits of carefulness that will save them hours of trouble and thought.

The leaflet at the top to the right requires no remark; it is carved like all the others.

When the three limbs are finished, the bottom must be carefully rounded off, and great attention must be paid to the form where it joins the ground. There must be no irregularity, but it must sweep gracefully round from the point of the right-hand limb to the point of the lower left-hand leaflet. Any irregularity in the outline would completely mar the effect of the whole.

The circular leaflet on the stalk to the left is done with a flat gouge. It slopes from the outside to the inside. This slope should be done first, with one sweep of the gouge from the left, and the leaflet should be trimmed afterwards, taking care to make first of all the notch for the little leaflet on the top.

In finishing, the amateur must take care not to leave any rags or jags or threads of wood anywhere; he must at all times make his cuts clean, and clear out all the angles and corners of his work. If the amateur will take pains to acquire this knack, one of the most essential to good carving, it will soon become a habit, and he will, if he have any talent for this very beautiful art, become a neat and finished workman.

For the last touches, level the ground as smooth as possible, and, if necessary, scrape it with the chisel. Go

all over the leaf, and smooth every part with the gouge. The leaf must not be touched with sand-paper; it obliterates all the finer touches of the tool, and gives the work a heavy dull appearance. With practice the amateur will be able to smooth his work perfectly with the gouge.

The tools to be used in rounding off leaves and scrolls, and ornamental work similar to this piece just described, are principally the flat gouge, the moderately flat gouge, and the moderately hollow gouge. All these should be bevelled from the inside as well as the outside. When I first commenced wood carving I used my gouge as supplied from the shop, not bevelled on the inside; but as soon as I came to try my hand at scroll work and ornamentation in the renaissance style, I was obliged to adopt the plan of the French carver, and bevel my gouges from the inside. I found that it gave wonderfully increased facility in working, and enabled me to do easily what would otherwise have been nearly impracticable. The rule with French carvers is the flatter the gouge the longer the bevel of the inside. The more hollow the gouge, the shorter the bevel, until the inside bevel altogether disappears in the very hollow and fluting gouges. There is this special advantage in a gouge bevelled from the inside as well as the outside, that it can be turned and worked either way, it can hollow out the base of a flower petal and then round it off where it curves over the extremity.

The ornament here introduced is of the same description as the former; it is excellent practice, and when the amateur shall have mastered it he will find that he has made a great step in advance.

The upper lobes to the left may either be rounded off

as shown in the illustration, or may be hollowed out by cuts of the gouge from the points downwards, the cuts gradually dying away into the body below.

On this leaf or ornament—the French term it a *culot*—may be practised a touch of the tool which is very common in the renaissance and Louis Quatorze styles, and gives to

the work an air of very high finish; it is called by French carvers an *echappée*, from *echapper*, to escape. It is, in fact, a little ridge of wood that has escaped the cut of the tool. It is used to prolong the lobe of a petal or a leaflet or

part of an ornament passing under another, or supposed to pass under another.

The upper part of this ornament on the left is divided into three lobes by two notches. From the rib of the centre lobe between the notches, the ornament rounds off to right and left. Now it will be seen from the shading that the right of the centre lobe is prolonged beyond the angle of the notch. This prolongation is by an *echappée*. It is made in this way :—the gouge is taken in the left hand and held by the right, as will be described in the next chapter, where an illustration of the method of holding the tool will be found. The gouge is then entered at the point of the lobe and, taking off a thin shave, the outer corner of the tool travels along the upper edge of the lobe, and sweeps on in the line of the shading, and then gradually lowers out. It must be remembered that to make an *echappée* the tool must always be on the highest side.

In the next chapter, in the illustration of the leg of a music-stool, will be seen several examples of this *echappée*.

The knack or art of making the *echappée* is difficult to acquire so as to do it neatly, but it is worth all the trouble that can be bestowed on it.

Masses of foliage, or any very prominent parts of a piece of carving, are almost always built up instead of being hewn out of solid blocks of wood.

Take a picture-frame, for instance. Suppose the wood to be one-and-a-half inches thick, sufficient for the scroll work or the foliage all round. On the top may be a shell, or some ornament projecting forward and requiring an inch more thickness of wood. To make the whole frame, or even the whole of the top frame an extra inch thick on account of this ornament, would be a wasteful expenditure of time and

materials too. Carvers leave a level place called a seat, where this extra thickness is required, and glue on a piece, taking care that the colour of the piece glued on shall be the same as that of the seat, the grain going in the same direction.

In this way carvers build up large pieces of work, and save much time and money by the method.

I conclude this chapter with a sketch of a rose, the proper size for carving, and a very pretty ornament of the same nature as the one above treated of. The rose itself should be carved half an inch deep at least—that is, the ground should be sunk quite half an inch. The petals on the right of the rose—that is, the outer petals—should be cut deep towards the inside; the centre petal of the three turns up a

little in the middle. Outline the rose, mark with the gouge the position and shape of the three petals next to the outer ones, strike off the wood to the round form of the rose, then with a pencil the remaining petals must be outlined, and then marked with the gouge. See that the position of each petal is correctly placed, and before commencing to carve, ascertain it by careful measurement with compasses. The centre unopened petals of the rose must be carved as deep as the level of the ground.

Carve the leaves with a raised rib; and to vary the lay of each leaflet, let one point up a little, the end of another droop over, and so vary them that the *ensemble* may be pleasing, instead of tame and flat.

The other ornament should be carved with the same thickness of wood; the hole in the centre, the inside of the leaflets to the left and to the right, must be carved as deep as the ground will allow; and the lines drawn in the centre of each division of the leaf must be incised with the graining gouge.

My readers may like to have a good black stain, so I give one.

1.

Gall nuts coarsely broken . .	2 ounces.
Rain-water	1 quart

Boil and reduce one half.

2.

White Vinegar	1 pint.
Iron filings	2 ounces
Antimony (powdered) . . .	2 „
Vitriol	1 „

Logwood a small handful.

Infuse in bottle eight days, tying the cork down.

To stain a piece of wood, give the wood a coating of

No. 1, it acts as a mordant; when nearly dry put on No. 2; let it dry quite, and then brush it over again with No. 2; keep down the fibre that may be raised, and then varnish.

A fine brown stain is procured as follows:—

Take a pound of the brown pigment called Terre de Cassel, put it into a glazed pot with 4 quarts of rain-water, boil until it is reduced one-half.

Mix 3 oz. (troy) of white potash with sufficient water to dissolve it, and mix with the Terre de Cassel.

This receipt was given to me by a French carver; the brown pigment is well known to artist's colourmen as Cassel earth.

This stain must also be put on with a brush, two or even three times, according to the depth of shade required.

CHAPTER IX.

INTEND, in this chapter, to give my young readers some further directions about carving in the solid, to show them how, in the higher branches of the art, the work is laid out and grounded, or blocked out, the features bosted, and then finished; how to execute those two beautiful edging ornaments, the bead and the ribbon round the stick; how to make the notch in delicate leaves without splitting them out, and to give some further instructions about grounding.

But, before commencing, I wish to recur again to two principles laid down in former chapters, and to urge them as strongly as possible on the attention of all my readers, especially of those who wish to become skilful and finished carvers.

In Chapter IV., page 35, I laid down this maxim—whatever you cut, cut clean; leave no rags, jags, or fragments; and in Chapter IV., page 37, I urged my readers to learn to use their tools with their left hand as well as with the right.

The first of these principles I consider so important, that although I have already explained my reasons for it, I refer to it again, as I wish, if possible, to force it on the attention of my readers, and so induce them to put it in practice, and carry it out thoroughly.

The maxim, "cut clean," is of far greater importance than would appear at first sight, and for two special reasons. First, a thorough attention to the rule ensures clean and careful work, both in bosting and finishing; secondly, it is a great element of rapidity of work. There is no necessity for going over it again after the clean finishing cut.

No work can look really well, and bear close inspection unless neatly finished; and no amateur will ever finish off his work neatly, and in a workmanlike manner, unless he learns from the first to cut clean; he will have acquired a slovenly, unworkmanlike style.

It is true, he may be able to finish off his work pretty well by taking infinite pains, and going over it again and again; but the process is painfully tedious, very disheartening, and at the end the work will not wear the look of high finish that it would assume under the hands of a workman who from the first had learned to cut clean.

Moreover, in thus finishing their work with painful tediousness, the element of rapidity is lost.

Many amateurs of my acquaintance turn out large pieces of work that, from the design and style, look handsome enough, but will not bear close inspection, because the work is not highly or neatly finished, such finish being beyond their powers, because they have neglected this most important principle.

"Oh," they say, "I have not patience to finish up my work;" and they say truly, for nothing can be more tedious or more disheartening than to have to go over again, and yet again, work that would have been finished easily, had they learned from the first to—"cut clean."

But remember that to cut clean, especially in finishing, the tools must be as sharp as oilstone and leather strap can make

them. In many instances the wood must be cut against the grain, and unless the tools are as sharp as they can be made, with fine long bevels, the work will look ragged and ill-finished.

The second point I have to bring again to the notice of my readers is to be found in Chapter IV., page 37, "Learn to use the tools with the left hand as well as the right."

At first this seems most difficult—almost impossible—but it is a mere matter of practice and patience, and in a week's time the left hand, with continual practice, will have acquired sufficient skill to encourage the amateur to persevere.

There is a way, too, of holding the tool, so as to make the right hand guide it, which, being of considerable importance, I will endeavour to explain.

Put the right wrist firmly down on the work, grasp the lower part of the handle with the fingers of the right hand, placing the thumb firmly against the side of the handle up towards the butt; the right hand will thus be able to guide the tool; then the left hand must grasp the top or butt of the handle, and supply the propelling power. In course of time, and with practice, the left hand will be able to guide the tool as well as the right.

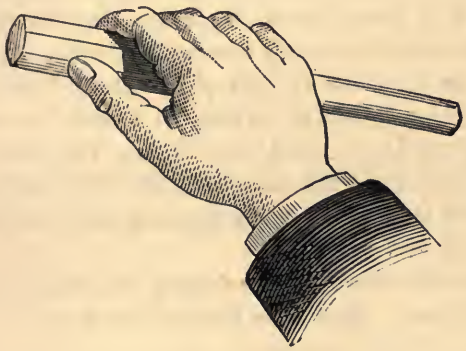
The annexed drawing will explain the method.

It is worth any trouble to learn to carve with the left hand. That person who can only use the right hand will constantly have to turn and refix his work, and then turn it again and again, losing one-third of his time. Moreover, he will never be able to carve a face and head. The French carvers fasten their work down upon their bench, whenever possible, with four long, slender nails; they use their right

and left hands alternately, finish their work beautifully, and get through it rapidly.

I will now enter on the subjects proposed at the commencement of this chapter, and will begin with some further hints about grounding.

Amateurs frequently experience great difficulty in grounding their work. A piece, for instance, composed of intertwined branches and leaves, where the spaces are small, and the ground has to be sunk deep; the difficulty being to



get out the wood from the small spaces, and leave the ground even and smooth, and of a proper level throughout.

When I first commenced wood-carving, I experienced this difficulty myself in more than one instance, and was driven to the verge of despair at seeing how uneven and haggled the ground appeared, in spite of all my best endeavours to get it smooth. I did eventually improve the grounding, but not to my entire satisfaction. I commenced, like all amateurs, by trying to sink the ground in these con-

fined spaces before touching either leaf or branch. And this was the error I committed. I did not consider that as I sunk the ground, and left the branches untouched, they became like so many surrounding walls, and prevented the use of the proper tools, the flat gouges. I could use none but bent chisels; so that the act of grounding became more like digging the wood out of little pits than lowering it in a proper manner.

I saw there was something wrong, and a little reflection put me on the right method, which is this: in proportion as the ground is being lowered, the intertwining branches and stems must needs be roughly lowered also to something like their proper level, and in their proper places, leaving untouched only such parts as are intended to stand out to the full thickness of the wood. In this way the ground can mostly be got at with flat gouges. In every way the grounding is much facilitated, and can be made even and smooth in the usual way.

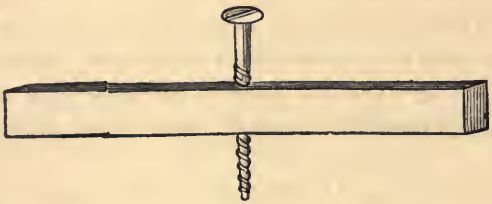
I may here remark that the English bent chisels are not sufficiently bent. Here is the English bent chisel:

It will be seen at a glance that the bend is not nearly sufficient where the space it has to work on is small or confined.

Here is the way the chisel should be bent to work

properly in a confined space. Moreover, the properly bent chisel should be bevelled from above, instead of from below, it cuts much better, cleaner, and more easily.

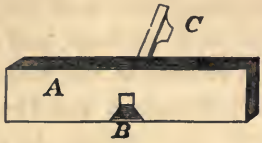
If the piece of work is large, and the spaces to be grounded are large, proceed in this way: take the square stick with the screw through it that I have described in a former paper, put the screw through to the required depth, then with a gouge sink several places on the space to be grounded, measuring the depth with the stick; cut channels from one to the other, and then level the wood between, and the ground will be quite level.



The places so sunk should be put quincunx fashion.

But to assist in smoothing the ground and getting it level in all parts, carvers frequently make use of a "router," a species of plane. The English carvers make these tools themselves; in Paris they are procurable at the tool-maker's, and of several sizes, from seven inches in length up to ten inches, and are called "guimbardes."

Here is a sketch of one; it will enable the young amateur to construct one for himself.



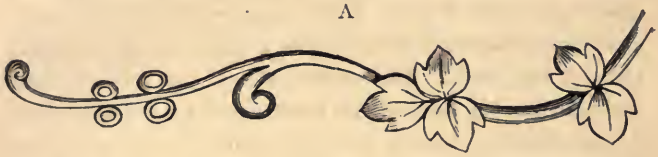
A, face of router.
B, shallow mouth leading to plane-iron.
C, plane-iron and wedge.

Where the ground has been lowered to nearly the proper level, the plane-iron is adjusted to the level. The plane or router is then put across the raised sides of the work being grounded, and the ground is then shaved down little by little. Where the grain of the wood is not kindly, the thinnest shaves must be taken off, and the router must be held very firmly.

The next thing to be explained is how to make the notch in a leaf without splitting it. The amateur generally splits the wood when making the notch in small and delicate leaves, and it is exactly in delicate groups that it is most injurious to damage one of the leaves, for then its size or shape must be altered, and this spoils the group. It is, therefore, absolutely necessary that the amateur should learn to make the notch successfully.

Here is an example, taken from a sketch of a leg of a music-stool in the style of Louis Quatorze, upon which I have been engaged. An engraving of one of the legs is given further on. Now, it is very evident that, if any one notch in any one of these leaves was to be split out, the size of the leaf must be reduced in order to reproduce the notch.

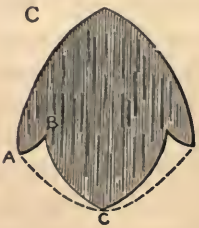
This would change the proportion of the leaf, and the effect of the group would be spoiled; there would be two large leaves and one little one, giving to the group an uneven appearance; and if the whole of the three leaves of the group were to be reduced, then the group would be out of proportion, and the effect would be mean. The notch might



possibly be glued up, but it is poor, cobbling work. In any small, delicate group of leaves the effect is spoilt when the amateur is compelled to reduce the size of the leaves.

Now, here at B is the same group as at A. The notch is put in, but to guide the amateur the general outline of the leaves is put in.

Proceed in this way: Cut the leaves down to the proper size and proportion. Lay or bost the leaves as they are intended to be, and undercut them. Here at C is a leaf of the group, at A enlarged, showing the run of the grain of the curved leaves. To cut the notch, first with the gouge cut transversely from A to B, (the leaf having been cut to its proper dimensions,) and whilst



so cutting press the gouge away from the line A B sideways towards C. This is a compound motion, the forward pressure of the edge from A to B, and a side pressure in the direction of C.

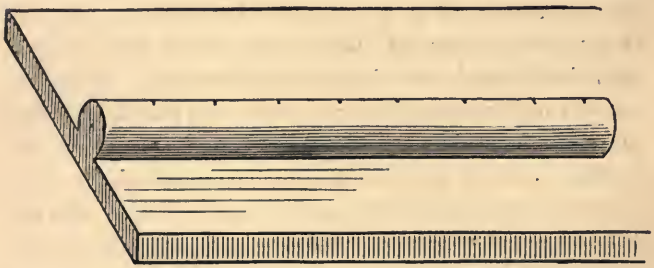
In like manner, the long cut from B to C must be a compound motion, a downward cut and at the same time a drawing cut from B to C. Great care must be taken to avoid any lateral pressure from B towards A, as this would inevitably split out the notch. The amateur should take a bit of wood and practise this method, his trouble will be well rewarded. I have watched a French carver do numbers of these notches on the smallest and most delicate leaves in very "splitty" wood; he did not split or spoil one, and he told me he never did split any; he employed the method just described. If the wood should be unusually "splitty," the notch can be cut little by little, the transverse cut being the first commenced.

We will now pass on to more interesting work, the method of carving a row of beads, or, as the French more elegantly term them, "pearls," and then the method of carving that elegant edging ornament, the ribbon round the stick.

The first thing to be considered in carving a row of "pearls," as we will in future call them, is the tool proper to be used. The principal tool is a hollow gouge, half round. This must be of the exact diameter of the intended pearls. The gouge must be bevelled from the inside to one-third of the outside bevel, and the corners must be rounded off. On the piece of wood intended to be ornamented with a row of pearls, raise what carpenters and joiners term a beading, like this, of the diameter of the intended pearls, and the height according as the pearls are to project, more or less.

Take the diameter of the beading with a pair of compasses, and mark it off all along the top of the beading, and pencil each compass mark.

Then at each compass mark a notch should be made down to the bottom with a flat gouge, each notch coming to an exact point at the bottom, or the least shade above the bottom, the point to come exactly under where the compass-mark was. When this is done, take the hollow gouge and commence rounding off the pearls. Cut in the direction of the line of pearls, keeping the hand low at the commencement to round of the top off the pearl, then gradually raising



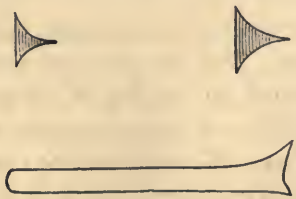
the hand till the gouge is perpendicular, this rounds off the pearl to the bottom. But very great care must be taken not to cut the very top of the beading or the pearls will be of unequal height. The cut must commence a very little past the centre of the top. When this is done, cut in the opposite direction, that is down the line of pearls in the same manner, the hand at first low, then gradually rising till the tool is perpendicular, and the pearls have been rounded off to the bottom.

When necessary, cut across the pearls each way until they are perfectly rounded.

When the pearls have been nearly rounded, take a bent chisel and very carefully clear out the little bits at the junction of the pearls at their base; and, lastly, with a bit of half-used glass-paper, rather fine, smooth off the little gouge marks, first running the paper along the pearls, then doubling the paper and rubbing lightly between them.

When pearls are raised at the base of a moulding or part of a frame that forms a backing to them, the space between the pearls and the backing is so confined that however skilful a man may be, it is impossible, especially when the pearls are small, to get the pieces of wood out from between the pearls and the backing so clean as to look neat and give the appearance of a perfectly level grounding. A very clever young carver, M. Réné Begot, of St. Malo, showed me a dodge that is most ingenious and effective. He makes use of a little instrument of the nature of a punch, the effect of which in clearing the spaces between the pearls and the backing is, as M. Begot truly says, most astonishing.

It will be seen that the tool is a triangle below, with one flat and two curved sides. The flat side is the back or outer



side, the opposite point goes between the pearls, and the two curved sides should be made exactly to fit the curves of the pearls. The metal of the tool gradually slopes away from

the triangular bottom, as indicated in the sketch, and this is most necessary to prevent the tool from splitting out the pearls. When the amateur has got out the wood from between the pearls, and levelled the ground as well as he can, he should take this tool in his left hand and, inserting the point between the pearls, the flat side against the backing, the curved sides pressing close against the pearls, give the top of the tool a light tap with a hammer; this will punch down the inequalities, with an effect, when managed adroitly, that is really astonishing.

This tool should be made of various sizes, to fit larger or smaller pearls. The back of the tool and the two curved sides should be perfectly smooth and polished, and the exact curve of the pearls can be given to the curved sides of the tool by a fine rat's-tail file, and a Turkey-stone slip will polish them. The punch should be made of fine steel; common iron very soon gives way at the points and edges.

The tool should be tempered, so put it into the fire until it becomes red-hot, then suddenly plunge it into cold water. Repolish the tool, put it again into the fire, and withdraw it as soon as it gets a slight tinge of blue. It will then be sufficiently hard, but not brittle. An old steel file softened in the fire, and then beaten out to the proper size, is most excellent for the purpose.

But this system of punches is useful in a variety of cases. The young amateur, for instance, will sometimes encounter a place where one part of a leaf passing under another, a pointed and deep oval is formed. To get the bottom of this oval perfectly smooth and level with the tools is most difficult and tedious, but an oval punch effects the object in a moment, and the amateur can make one for him.

self in a very short time. All old files should be kept for such purposes, softened in the fire, and then filed down.

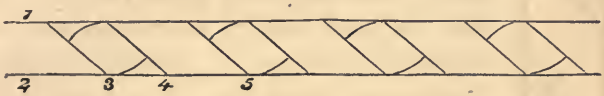
The ribbon round the stick is a very rich and handsome edging or moulding ornament, when neatly executed, and is worthy of any trouble that may be bestowed upon it.

To execute this, first raise a beading of the diameter of the intended ribbon; then take a pair of compasses, and mark off all along the top of the beading two and a half diameters of the beading. When this is done, set off at each mark one diameter; the marks will then be one diameter and one a half diameter, alternately all along the top of the beading.

The one and a-half diameter are the ribbon, the one diameter is the opening between the curls of the ribbon. Now take a bevel, and run a line diagonally through each mark at the angle wished to be given to the curl of the ribbon. An angle of about forty is the best. I may here remark that the width given to the ribbon or to the opening may be varied at pleasure. Some make the ribbon and opening of the same size; others make the ribbon one diameter, and the opening one and a half diameter—the reverse of the above proportions; others, again, make ribbon one diameter, opening two diameters; but the proportions above given look better and richer, and, moreover, are more easily and quickly worked. It must be borne in mind that the space between the curls of ribbon will vary according to the breadth of the ribbon, the diameter round which it is rolled, and the angle at which it is rolled. If from the shape of the piece of wood, or any other circumstance, the bevel cannot be employed to mark on the beading the diagonal lines for the ribbon, a common flat ruler must be used, the spots for the lines being first measured off by compasses.

Care must be taken to rule the first line at the proper angle, as all the others will take the slope from it.

Here is a sketch of the way the lines are ruled: 1-2, the diameter; 3-4, a diameter; 4-5, a diameter and a half; and so on. 1-3 forms an angle of forty degrees. After the



diagonal lines for the ribbon have been successfully marked and drawn, the next thing is to draw the lines for the stick.

First, take a firmer chisel, and with moderate but decided drives with the palm of the hand cut perpendicularly down on the top of the bead at each diagonal mark. It must be cut down the eighth of an inch; then with a chisel adapted to the size cut out to the depth of the eighth of an inch the narrow pieces, the diameters,* leaving untouched all the pieces of one and a half diameter. This will leave a little flat place on the top of the parts forming the intervals between the curls of the ribbon. Now mark a point on the top of the beading at each end to show the exact centre, and points on each side of these to mark the thickness of the stick. Take a flat ruler, and on the spaces cut out rule lines from the points at each end; and if these points have been correctly placed, the stick will run exactly down the centre. The thickness of the stick may be as much as one-fourth of a diameter, but one-sixth is a better proportion. The sketch here given will explain the method: 1-1 are the central points; 2-2 and 2-2 are points marking the thickness

* The top only.

of the stick; 4 4 4 4 are the pieces cut out and the stick marked out. The stick is left unshaded, in order to show it better.

Take the firmer chisel, and cut perpendicularly down the lines marked for the stick, then with a moderately deep gouge take out the wood, not quite down to the bottom, the cut sloping down from A to B. Undercut the stick, so that it may be clear from off the bottom, and the light may be seen under it. If the amateur will curl up a long narrow slip of paper, and lay it before him, he will see why the cut should slope down from A to B. When the wood between the curls of the ribbon has been cleared out, and the stick undercut, take out the small corners marked 5 in the sketch, to give the breadth of the ribbon below. To get the exact size of the corner to be cut out, measure across the ribbon as at the dotted line at 6, then put the point of the compass at 7, and prick off the breadth at 8. These corners must be cut and taken out neatly, or the effect will be spoiled, and the pieces taken out between the curls of ribbon and alongside the stick must be taken out neatly, and to the same depth, or the effect will be spoiled; and again, the stick must be perfectly in the centre, and of the same thickness throughout, or the effect will be spoiled. The corners of the ribbon must be very slightly rounded off and hollowed out, as shown at 7, so as to follow the curve of the ribbon. A look at the piece of curled paper before-mentioned will show this.

When all this has been done, there only remains to grain the curls of ribbon. This is done by two strokes of the graining-gouge on each side of the curls and on the top; one stroke being made up the ribbon, the other the contrary way, and each stroke from edge to edge. This gives the ribbon a wavy appearance, and makes it look richer. If the strokes on each side were made the same way, it would give the ribbon an odd, lop-sided appearance, very unartistic, unworkmanlike, and heavy.

I will now endeavour, as I proposed at the commencement of this chapter, to show my readers how, in the higher branches of this beautiful art, the design is transferred to the wood, grounded, bosted, and finished.

Every piece of carving of any pretension goes through three stages after the design has been put on the wood. First, it is blocked out or grounded—that is, the design is marked out by a gouge and chisel, and the ground sunk; then it is bosted, or rough carved—"ebauché," the French term is—and then finished.

There are several ways of transferring the design to the wood. With the methods of taking off the design on tracing-paper, pasting the tracing on the wood, or of putting the design on to the wood by means of carbonic paper, my readers are already acquainted. These two methods are admirable for flat surfaces; but when the surface to be carved is rounded they cannot be employed, and recourse must be had to other means.

Here are engravings of a leg of the music-stool, to which I have already referred. A very little consideration will show that it would be impossible, on account of its rounded form, to paste a tracing of the design on it, or to

use the carbonic paper, therefore some different plan must be adopted.

The design must be carefully traced off, and the tracing pasted on a piece of thin cardboard. One tracing will be required for each side of the leg; that which is intended

for the reverse side may be copied off in pencil, as more expeditious. This pencil-tracing must be pasted on to the cardboard, pencil side next to the cardboard, and there will be a right and left copy of the design. The pencil marks will be very distinct through the tracing-paper, and cannot be rubbed out.

When the pasting has dried, the cardboard must be cut away very neatly to the outline. The tracing must now be put on a soft board, and pricked through at short intervals with a sharp-pointed pricker. When this has been done throughout, the tracing must be turned over on the board, and the projections raised by the pricker cut off with a very sharp chisel, and, when necessary, the holes round cleared with the pricker.

The wood for the leg having been selected, the design must be laid on, and the outline carefully traced with a pencil; it must then be taken to the saw-table and sawn out on both sides.

The engraving represents the leg in three stages, sawn out, blocked, and bosted and finished. When the leg is sawn out, the first thing to be done is to cut away all the superfluous wood, and reduce it to dimensions suitable for carving, and give it the rough outline of its future shape. The leg as it comes from the saw is everywhere square. When the edge is turned to the front it is at once seen that towards the back it is a great deal too thick, and this thickness must be reduced by a third. The wood where the two volutes come in must be left the full thickness. The depth of the three groups of pendant leaves at the top, and the four groups, below the upper volutes, must be marked off, and the wood left the full thickness.

To make use of the pierced tracing, take some prepared

whitening, crush and then tie it up loosely in a piece of moderately coarse, loose, woven cotton or linen cloth. Adjust the pierced tracing very carefully to the head of the leg, and dust it over with the whitening by striking the bag several light blows over the tracing, which must be pressed down with the fingers. Lift the tracing carefully, and then pencil on the design, guided by the lines of white dots made by the whitening and by the tracing placed on the bench close in front.

Then do the same with the two volutes, and as soon as these three points are established, commence cutting down the superfluous wood between them, rounding it off to its outside future shape. Then begin the volute, and as soon as one is done hold the leg up, so that the eye may see both sides, and mark on the untouched side the level of the volute bosted on the other. The volute being bosted and the superfluous wood cut away, the head ornament must be bosted also. The tracing must now be applied to the centre, between the head and the volutes, and as much marked off as possible, then to each part in succession. It is a troublesome and difficult operation, and the compasses and pencil must be kept constantly at work. The reason for this plan of proceeding is that the tracing must be humoured to suit the curve of the wood; for it must be remembered that the design is a flat surface, but that the leg has become curved, and in consequence its surface has been enlarged, so that if the design were to be laid on the upper part and marked continuously downwards, the volute would be out of place by nearly a quarter of an inch, and this quarter of an inch has to be distributed over the whole surface.

The amateur will now see that the advice I gave in a former chapter, to learn to use the pencil, was sound advice.

When one side is pencilled it may be marked in with the tools, but before commencing the proceeding, the two volutes

FRONT OF STOOL.

and head ornament must be placed in position on the opposite side; by holding up the leg, the edge towards the

SIDE OF STOOL.

carver, as mentioned before, so that the eye can see both sides, the level of the volutes, and of each ornament can be easily marked off.

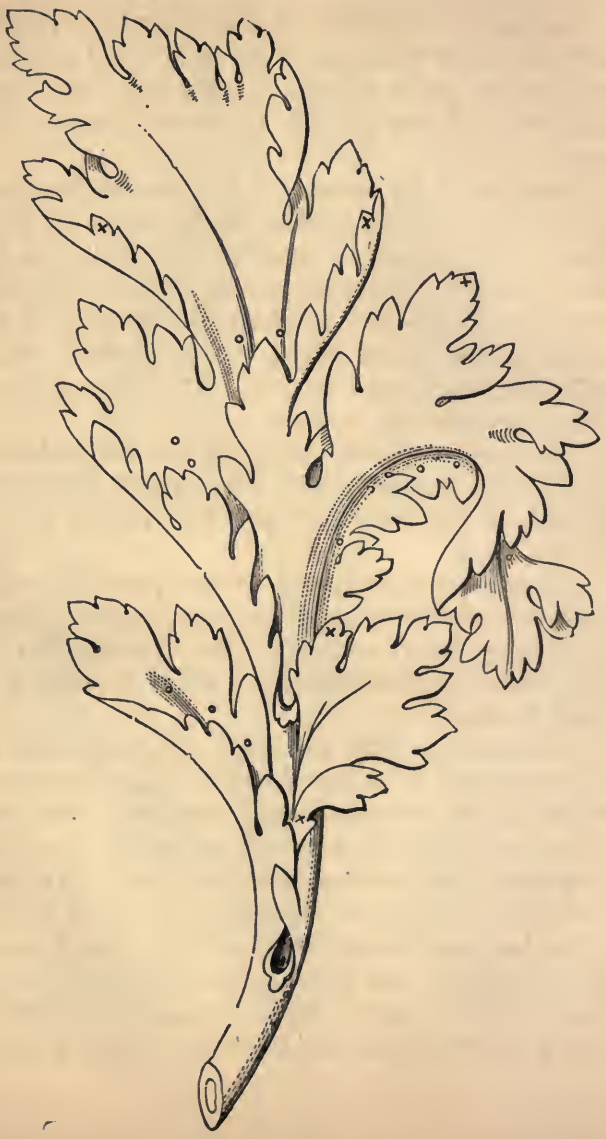
On this system the most difficult and intricate designs can be transferred from paper to the wood; but I repeat it, every one who wishes to become a skilful carver must learn to use the pencil so as to be able to pencil his design on the wood.

Should any of my readers wish to carve this stool they must recollect that the head of the leg, where the cross piece fits in, must not be carved until that piece is in its place, so that the contiguous parts may be bosted together. In this way a proper level is obtained, and the parts of the design are made to run properly into each other. When this is done, the leg and cross piece can be taken apart, and each be proceeded with separately.

Illustrations of the cross pieces are here inserted for the use of such of my young readers as may wish to try to carve the stool. It will be a difficult task, but they must not be frightened by it.

I recommend the design on previous page for a photograph frame to the notice of my young readers. When carved in sycamore wood, which is very white, it makes an elegant drawing-room ornament. It should be enlarged to double the size.

The wood should be half-inch. When the frame is sawn, the rabbet or channel for the photograph and glass should be made before any carving is attempted. The rabbet should be only just deep enough for the glass and the photograph—an eighth of an inch should suffice. This will enable the carver to sink the frame deeper, and let the foliage have more room. The leaves look richer if carved with a raised rib. The back should be closed in by a thin board, cut to the shape of the three frames; it should not come flush with the edge, and should be bevelled off. Four



small screws will fasten it very well. The supporting leg should be five and a quarter inches long, and should be fastened to the centre of the back with a brass hinge screwed on to the foot a quarter of an inch below the top. Then from the hinge to the top of the foot outside, the wood should be bevelled off; this forms a shoulder, and enables the leg to support the frame at a proper angle.

On pp. 128 and 129 are two illustrations of an Acanthus leaf, one in outline, and the other shaded. This is most excellent practice, and I strongly recommend it to my readers. The outline should be enlarged to double its present size in the manner directed in Chapter V.

The wood should be one and a quarter inches thick, the leaf carved to the depth of an inch, leaving the quarter inch for the foundation. At each x the wood at this point should be left the full thickness; from the x it should slope away gradually. At o o o o the leaf should be sunk as low as possible; that is, within a very little of the level of the ground. With these short instructions, and the aid of the shaded illustration, the amateur will be able to produce a perfect copy of the leaf; but I must caution him to vary the height of all the leaflets; if all were left of the same height, the effect would be stiff and heavy, and totally wanting in gracefulness. This is a hint worth remembering for future use. The wood should be walnut, pear, sweet chesnut, or lime wood.

CHAPTER X.

OME of my young readers tell me that in sharpening the inside of their flat gouges the Turkey slip is liable to glance off the tool, and that when this occurs, they sometimes cut their fingers.

As this is not agreeable to any one, and is especially inconvenient to my lady readers, I will point out a simple and efficient remedy.

Get a small block of wood, deal will do, two and a half inches longer than the slip, two breadths of the slip wide, one and a half breadth deep. Sink in this block two holes each hole the length of the slip, and in depth half of the slip One of these holes to be of the V-shape of the slip. Drop the slip into this hole, and it will be held firmly the broad edge upwards.

The other hole must be the breadth of the broad edge of the slip, one side to be undercut to the angle of the slip, the other side must be perpendicular. Drop the broad edge of the slip into the hole, and insert between the slip and the perpendicular slide a thin wedge of wood or cork, and this will keep the slip quite firm, the narrow edge upward.

This plan is very suitable for my lady readers; it will enable them to apply both hands to their gouges when sharpening them on the inside, they cannot cut their fingers, and can sharpen the gouges with greater precision than when holding the tool in one hand and the slip in the other.

One of the greatest ornaments in wood carving is the

human head, natural or grotesque. It can be introduced with effect almost anywhere, especially amongst the graceful scrolls and ornamentation of the Louis Quatorze and Renaissance styles. Amongst my readers, many I hope will make such progress in this beautiful art of carving in wood, as to entertain a desire to try the sculpture of heads. I will therefore endeavour to give them such instructions as will enable them to make the attempt with fair hopes of success.

I will premise that before any attempt can be made to sculpture heads, it is absolutely necessary that whoever wishes to try it must be able to use his tools with the left hand as well as with the right, and must constantly and perseveringly practise with the left hand to attain the requisite skill, if he have it not already.

Suppose it is desired to carve a face on a box-lid in the midst of scroll work or foliage, the first thing to be done is to sketch on the spot where the face or head is to be, an oval of the exact size of the required head, and to draw a perpendicular line through it. The thickness of wood required for the head will be mentioned a little further on. Divide this line into four equal parts.

The next thing to be done is to make a scale of parts, and for this purpose on a separate piece of board draw a line corresponding to the line within the oval, and divide this also into four equal parts. One of these parts must be subdivided into twelve parts, these are called minutes. This is the scale. Where a head is to be large and great exactness is required, these minutes may each be subdivided into four parts; but the division into minutes is sufficient for our purpose.

The three heads here inserted will, with a little explanation, elucidate the whole process of carving the head and

face. It will be seen that the face is a full face, and that there is a diadem on the head. The three heads show perfectly the three stages of carving: first, the features placed in position (blocked out); second, the face bosted; third, the face finished.

The length of a head—from forehead to back—in a full-grown person, is three parts eight minutes for a man, and three parts eleven minutes for a woman.

To carve a head like the following, the piece of wood should be of the thickness of two parts; of this the head will take one part seven minutes, leaving five minutes for the foundation. Therefore, when the oval has been drawn on the box-lid, a piece of wood should be glued on to the oval to give the required thickness. If it is not desired to have the face stand out so much, then a less thickness of wood will suffice. As a good general rule, for heads carved on a flat surface, where it is not desired to make them stand out much, the thickness of the wood should be one third the length of the head; that is, one part four minutes.

To return to our faces. The face with the diadem, hair, and curls, must be pencilled in from careful measurement, and then blocked out as in figure No. 1.

The proportions for the head and face of a full-grown person are as follows:—

From top of head to commencement of hair on forehead, one part.

From commencement of hair to top of eyelid, one part.

From top of eyelid to bottom of nose, one part.

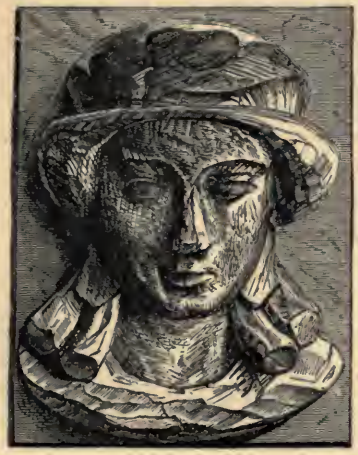
From bottom of nose to bottom of chin, one part.

In all, four parts.

Breadth of face, two parts two minutes.

Length of eye, without the oval inner corner, six minutes.

Length of eye, including inner oval corner, seven minutes.
Opening of the eye not less than two and a half minutes.
Breadth of nose at nostril, six minutes.
Breadth of middle of ridge of nose, two minutes.
Height of nose, six minutes.
Length of mouth, nine minutes.
Space between the eyes, six minutes (one eye).



No. 1.

From bottom of chin to throat, one part.

From bottom of nostril to bottom of ear, one part six minutes.

Length of ear, one part.

Length of neck, one part.

Thickness of neck, one part ten minutes.

The diadem on the head comes below the commencement of the hair.

Having drawn a perpendicular line through the oval for the face, and divided into four equal parts, the features should now be pencilled in. Commence with the eyes, eyebrows, and nose. The first mark on the line drawn through the oval, shows the commencement of the hair. The second shows the level of the top of the eyelid. Lay a foot rule, or any flat ruler, across this mark, and draw a horizontal line through it across the oval; now mark off the eyes, the inner corner is three minutes on each side of the

line, this gives six minutes, or one eye between the eyes. Having marked the distance of the eyes, now mark their length and the opening. Length, six minutes; opening not less than two and a half minutes. But observe particularly that the outer corner of each eye is slightly higher up than the inner; at the same time care must be taken not to raise the outer corners too much, so as to give the eyes that ugly oblique position, the Chinese, or pig's eye.

No. 2.

The extremity of the nose is at the third mark on the perpendicular line drawn through the oval; from this, mark off the breadth of the nostrils. Sketch out the shape of the chin, the width of the nose in the middle, and the masses of hair.

The breadth of the nose in the middle having been marked out, take a flat gouge and slightly block it out, and cut away some of the superfluous wood round the face, bringing it to something of its natural shape, as in the engraving. The eyes must now be placed in position, so take a hollow gouge and make the deep hollow for the corner of the eyes on each side of the nose. Then with a quarter round gouge mark the position of the eyes and eyebrows, leaving little elevations for the eyelids and eyebrows, as in the engraving. The hollows for the inner corners of the

eyes are always done with a hollow gouge, which is used also for cutting away the wood from each side, and from the bottom of the nose. Each side of the face should now be rounded off to its natural shape, and the neck and curls should be blocked out. The measurements being all taken from the central line drawn down the oval, it must be renewed as often as it is cut away in shaping the nose.

The mouth must now be placed in position. The fourth or lower part of the oval, that is, from the nose downwards, must be divided into three; and the opening of the mouth is exactly at the upper mark, leaving two-thirds for the under lip and chin. The lips and hollow below the lower lip must be just indicated by the hollow gouge.

When this is done, the drapery may be blocked out, and lastly the hair at the side of the head and the diadem, or the hair may be blocked out without the diadem, in which case the top of the head must be rounded off, and the parting of the hair just indicated with a small hollow gouge.

In cutting down at each side of the face to get to the curls, the point of the ear must not be forgotten; nor must it be forgotten that at the outer corner of each eye there is a little hollow, dying away into the temple, as seen in the illustration; and that the face broadens a little from the corner of the eyes to the temple.

In commencing the bosting, the first thing to be done is to pencil in the eyes; they must be carefully measured off from the central line, which, as before mentioned, must be renewed as often as it is cut away. The inner corners must first be measured from the central line and pricked off, and the pencil must be laid across the line to see that the marks are exactly on the same level; then the marks for the outer corners of the eyes must be marked off, and the pencil laid

across again to see that they also are on the same level; and the caution just given must be borne in mind not to raise the outer corners so much as to give the eyes undue obliquity. Moreover, in placing these marks it must be remembered that the second mark from the top on the central line of the oval is the level of the top of the upper eyelid. When after careful examination the marks are found to be properly placed, draw the lower eyelid, then prick off the opening of the eye, and draw the upper eyelid. Now take a very fine hollow gouge (the smallest size) and make a groove just under the pencilling of the upper eyelid, and another groove above the pencilling of the under eyelid. Do the same on the other side, and look at the eyes to see if they are both alike. These grooves rough out the eyelids. With the same small gouge make the hollow above the upper eyelid under the brow. When both eyes have been so far made alike, take a gouge of suitable sweep, and where the groove was made under the upper eyelid, cut down to the eyeball, not quite perpendicularly, but a little sloping out towards the upper eyelid. Do the same to the lower eyelid, but cutting quite perpendicularly; and in forming the eyelids remember that the upper eyelids are thickest at the edge;

No. 3.

they give birth to the eyelashes, and must be rounded off to meet the brow. When the eyelids have been cut, reverse the gouge, and with the inside shape the eyeball. If the gouge is not flat enough or too flat, choose one of a suitable sweep; for the eyeball must be shaped by clean cuts; they must be smooth. The outer corners of the eyeball are taken out by a small skew chisel. At the outer corner, the lower eyelid passes under the upper one, which dies off gradually towards the temple.

When the eye-balls are properly rounded, take the pencil and mark the place for the pupils; then with a firmer chisel make the little flat places for the pupil and iris, as shown in the illustration. This requires the greatest care, as both eyes must be exactly alike, or the effect will be most disagreeable.

The last thing to be done to the eyes in this stage is to form the two inner corners. A reference to the illustration will show that they are little ovals, and that outside the oval there is a little gland. This gland must be left when the eyeball is rounded. The oval corner is formed by deep cuts, with a very fine hollow gouge; one cut towards the nose, one towards the eye, joining the angle of the corner.

The mouth must now be bosted; and first the distance for the opening of the lips must be exactly marked off, and the mouth carefully sketched with the pencil. The opening of the lips is exactly one-third of the distance between the mark for the base of the nose and the mark for the point of the chin. When the mouth has been sketched, take the fine hollow gouge used for the eyes, and make the outline of the opening of the lips; then with a large hollow gouge make the channel under the nose, and with a flat gouge reduce into shape the upper part of the lip, from the channel and nostrils downwards towards the cheek. When this has been done,

take a small half-round gouge, and make a slight and only just perceptible groove above and on the very edge of the upper lip; it is to die away at each corner. This shapes the lip above, and marks the limit of the red part; and as the groove dies away into the corner of the mouth, it gives the lip that shape called Cupid's Bow. From this groove the lip is rounded off into the mouth. From the channel below the nose, the superior part of the upper lip slopes gradually away to the cheek and to the base of the nostrils, and the channel itself dips down from the edge of the lip, and rises to the base of the nose.

Now sketch out the under lip and the chin, and with the hollow gouge complete the hollow under the lower lip. The lower lip must now be shaped in the same manner as the upper, by making a very slight groove under it with a small half-round gouge, and from this groove, which also dies away into the corner of the mouth, the lip is rounded off into the mouth. The corner of the mouth is hollowed out by a very fine round gouge, changed for a larger size as the hollow rises into the cheek.

Whilst the superior part of the upper lip is being bosted, the nostrils should receive attention, their breadth should be carefully measured off before the central line below the nose is finally cut away. They may then be shaped and hollowed out, and the bridge and point of the nose may also be reduced to their proper shape and size. The nostrils being completed, the exact place for the point of the ear should be measured off. The point or bottom of the lobe of the ear is on a level with the lower part of the nose, and the distance is one part six minutes from the bottom of the nostril.

The gouge employed to make the hollow under the lower lip must be used to make the hollow or dimple in the

chin, and as soon as this is made the chin can be rounded off, and the throat and neck bosted down to the drapery. It will be observed that the neck rises a little into the throat, and that just above the drapery the undulation of the bosom is seen, and must be carefully imitated.

The forehead should now be attended to, and the masses of the hair and curls be carefully pencilled in, and the hollows between the masses distinctly and deeply bosted. The detail of the hair is afterwards worked out in finishing. This requires no particular explanation; the illustrations are quite sufficient to guide the amateur.

Lastly, the drapery should be pencilled in and bosted. The folds of the drapery where they join the bosom should be so arranged as to cover it equally to the right and to the left. The deep creases can be commenced with a large V tool, and completed with gouge and chisel.

In finishing the head, the first thing to be done is to put in the pupil of the eye and the iris. With a small hollow gouge the size of the intended pupil, or with a pencil, slightly mark on the centre of the little flat place made on the ball of the eye the spot where the pupil is to be; then mark the other eye; and when the pupils are found to correspond, mark in the iris with a larger gouge. Now look well at both eyes at a little distance, and if there is any difference in the position of the marks, it will at once be seen. To have one pupil higher, or lower, or more to one side than the other, has a most disagreeable effect. When the marks are found perfectly to correspond, cut the pupil, as seen in the engraving of the finished head (No. 3). It must not be a complete circle, neither must the cut for the iris be a complete circle. A little bit is left uncut towards the upper part to the left of both pupil and iris, and this little bit is

opposite to the broadest and deepest part of the cuts. They represent the light shining on the eye. When the cuts have been successfully made, deepen them on the side opposite to the uncut spot, by driving the gouge in with a smart blow; this is what the French carvers term a *coup d'effet*, and a great effect it has.

Finish the mouth in the same way with a *coup d'effet* between the lips, taking care not to mark the lip with the edge of the gouge. It gives the appearance of great depth, and separates the lips in the most natural and life-like manner possible. The whole face must be reviewed, and the last touches given with the flat gouges.

The details of the hair and curls must now be worked out with fine hollow gouges and graining gouges, and the masses must be made more distinct, and more completely separated by a succession of *coup d'effet*. In this the amateur must exercise his own judgment, following, as far as he can, the detail shown in the finished head.

Lastly, finish the face, neck, and chest by smoothing off the gouge-marks with carver's files and sand, or glass-paper, taking especial care not to touch the eyes or the edges of the lips.

The amateur must always keep pencil and compass employed until he gets all the features correctly placed in position and bosted; and he must constantly look at his work from a little distance to judge of the effect, and to see that both sides of the face are alike. He must not only look at his work from above, but from a horizontal position also, stooping down for the purpose, so that he may see that one side of the face is not higher than the other; and, in fact, he must look at the features in every way, and in every light, and do his utmost to ensure the two sides being alike.

Moreover, I would strongly advise the amateur who

wishes to try to carve a head to buy a good plaster cast of some classical head, and keep it before him as a model, see how every feature is turned and moulded, and follow it with gouge and chisel as closely as possible.

The French carvers always commence with the left side of the face and head; and in fact, whatever they may carve, they always commence with the left side. No one will be able to carve a head who cannot use his tools with the left hand as well as with the right; therefore I reiterate my advice to practise perseveringly with the left hand, in order to acquire the necessary ability. The proper method of holding the tools has been explained and illustrated; the amateur should follow the instructions as precisely as possible, and his labour and perseverance will soon be followed by a rich reward.

In Chapter IV., amongst other maxims, I laid down this: "Don't skip from stalk to stalk, from leaf to leaf, or from one part to another, but finish each leaf or part as far as you can before commencing another, and go through the whole work regularly. There are times and occasions when this rule may and must be violated, but experience will teach you." And carving a head and face is precisely one of those occasions when the rule must be violated. A little at a time must be done to all the features, so as to give a due proportion to all; to balance, as it were, properly, all the features one against the other. When once a feature is finished, its proportion cannot be altered; and if one feature —the nose, for instance—was to be at once entirely finished, it might be out of all proportion to the eyes and chin. Therefore advance all the features little by little, and, as it were, simultaneously.

I now wish to introduce to my young readers a species

of carving that is, in my opinion, specially suitable for my lady readers, and may be classed as a drawing-room occupation. It may be called Sunk Carving; for, contrary to the usual method, the carving is sunk, whilst the ground is left at its original level.

This species of carving is more suitable than any others for book-covers, or to be employed in places where the carving is liable to be rubbed; because, being sunk below the ground, it cannot get rubbed or chafed until the ground itself is worn down.

This "Sunk Carving" is specially suited to ladies, because it requires no strength of arm or wrist, there is no hammering required during the carving, driving the gouge with the palm of the hand now and then being quite sufficient. It may be carried into the drawing-room, for there is no noise, and the proportion of chips from the process is very small, and may well be collected on the table. When the carving is finished, and the ground has to be punched, then of course hammering is required, but this can be done anywhere. The panel to be carved can be screwed on to any tolerable firm table; and if a sheet or two of paper be laid underneath the panel to be carved, the table, however finely polished, will receive no hurt.

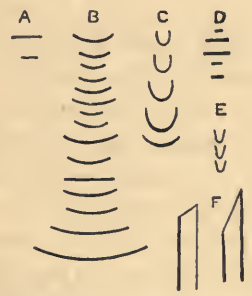
A single cramp will suffice to fasten the work, and if the top of the screw is furnished with a moveable head, the under part of the table where the screw is fixed cannot be scratched. With a couple of dozen or thirty tools, a correct eye, and a skilful hand, most beautiful work can be produced.

Here is an engraving of a panel * I have had carved in this style by the clever young French carver, mentioned in the preceding chapter, Mr. Réné Bigot, of St. Malo, and I

* See Frontispiece.

advise those of my young friends who may pass through that town in their autumn tour through Brittany to pay a visit to his atélier.

The panel is walnut, the carved part measures ten and a half inches by six and a half inches. The design is adapted from some artistic work published in Paris. The engraver has very finely and skilfully rendered the carved panel, and with its help a short description will soon make clear the method of executing this peculiar and beautiful variety of wood carving.



A.—Firmer Chisels.
B.—Flat and quarter-flat Gouges.
C.—Hollow Gouges.
D.—Bent Chisels.
E.—Graining Gouges.
F.—Skew Chisels.

The greatest number of tools that can be required will be about thirty, viz., four bent chisels, commencing from the very finest in regular succession; three graining gouges, four hollow gouges, fifteen flat and quarter-flat gouges, commencing from one-tenth, two firmer chisels of one-tenth and two-tenths, and two skew chisels, one very pointed, one less pointed.

The above are impressions of the sizes.

The wood chosen should be good, old, well-seasoned walnut; it works freely, takes a good polish, and does not split easily. The pattern should be laid on the board and fastened lightly with a couple of fine tacks, or needle points; then with a very fine steel point prick out lightly the whole pattern. A single line of prick marks will suffice for the stems, but the outline of the leaves and flowers, etc., with

their inner angles and projecting points, should be carefully pricked out. One of the best instruments to use as a pricker is a bit of a knitting needle put into a stout handle, and ground to a fine point. The handle should be rather larger towards the pricker, or a little hollow should be made for the finger and thumb, so that the tool may be held easily, or else in long pricking the hand becomes cramped with the exertion of holding the pricker tight.

Where the pattern has been pricked over it must be carefully pencilled on the wood, and the outside line only of the stems having been pricked, the inside line must be put in, and must be done very carefully.

A very little consideration of the pattern will show the intelligent amateur that a trifling irregularity in the sweep of the graceful curves of the stems would ruin their appearance, and make the outline hideous, and he will at once perceive that on such slender stems, an irregularity incapable of remedy would be caused by a very small slip or misdirection of the tools. Take, for instance, the stem enclosing the rose, it would lose all its gracefulness were there a projection, a bend, or a flat place in the curve, it would simply be ruined, and this would inevitably be the case if the edge of the tools were not placed with the utmost precision on the traced line.

The first thing, therefore, that the amateur should learn is, how to hold the tools properly, so as to avoid so serious a mischief.

When cutting the outline of these stems, or in fact whenever applying the tools to any piece of carving requiring exactness, the proper method is to grasp the handle of the tool in the left hand, edge downwards, and take the blade within an inch of the edge, between the thumb and fingers

of the right hand. Place the edge of the tool on the traced line, press the handle down with the left hand, and if necessary let go with the right hand, and strike with the palm of that hand.

It will be as well to describe the method of carving one of the leaves. The leaf, for instance, on the right, in the middle just by the snail.

The leaf having been pricked out and carefully pencilled, take a small flat gouge, and holding it as above described, handle in left hand, blade between thumb and fingers of right hand, make the cut for the small and inner part of the notch in each leaflet, pressing down the gouge with the left hand, and, if necessary, giving a slight drive with the palm of the right hand. The small part of the notch of a leaf must invariably be made the first, the long part afterwards. When this has been done, outline the leaf with suitable gouges. Take a fine round gouge, and make the round at the top of the leaf; then with a flat gouge make a deep cut all along the dark line which commences at the round part, and goes through the leaf, leaving two leaflets to its right. This cut deepens as it gets to the centre of the leaf, and is deepest at the bottom of the upper right leaflet. Continue this line down to the stem. Make diagonal cuts downwards from the left to meet this perpendicular cut, and take out the pieces. Reverse the gouge, and, with the inside downwards, round off this cut from the left deep down, rounding it off suddenly—that is, don't make it too flat. Now take a smaller flat gouge, and round off the leaflets to the right, the larger one rather suddenly into the cut, the upper one to slope gradually down to the bottom of the cut, deepening the leaflet into the point, the lower part of the lower leaflet to be left the full height of the wood. So the

same with the leaflets to the left. The upper point of the main leaflet on the left is very slightly hollowed out from the centre to the point, deepening gradually to the point. When this is done and the leaf got as smooth as possible, it must be veined. The veins are everywhere double, and great care must be taken to make them run nicely into one another, and not to commence them too far apart.

Frequently a portion of a leaf is kept the full height of the wood, for the sake of contrast with the other part, and to give a bolder effect. In this case the part so left requires to be more detached from the ground than by the mere perpendicular cut that outlines the leaf. This detaching is effected by cutting a thin shave from the ground outside the part, and it must be done with the greatest care to make the cut entirely parallel to the outline of the leaf.

Perhaps an illustration of the leaf made rather larger will help to make this description clearer. Here is an enlarged outline of the leaf; the dark line down the centre shows where the leaf is deepened; x x show where the wood is left the full height; o o where it is hollowed out slightly; the dark lines outside the leaflets show where the ground is cut away to detach the leaflet.

In doing the stems, commence with the outer edge of each curve, and see that they are quite correct before commencing the inner edges; and, indeed, whatever the amateur may be carving, whether in this style or in the solid, the outer edges of all curves should be done and corrected before the inner ones. Hold the flat gouge as above described; the thumb and fingers of the right hand will place the edge of the tool on the line with great exactness; the pressure of the left hand will sink it deep enough. When the cuts for the stems are done on both sides, take out the pieces by

cutting with the flat gouge from the top of the cut on the outside to the bottom of the cut on the inside, and then from the inside. This leaves a little ridge in the centre, and gives the stem a natural and rich effect. When the stem is too deep, as in the dark piece behind the squirrel, or too narrow, as in the stem of the rose-bud, the pieces must be taken out with the bent chisel, and the bottom is left flat.

It may be as well to tell my readers that the bent chisel cuts better when sharpened from above. If my readers have not got or cannot get graining gouges fine enough for the delicate veins in the leaflets, they must use a V-tool, but the sharp edge of the V-tool below must be rounded off; this makes it travel better round the curves. I may also mention that the very finest graining gouges, and the finest gouges of all kinds, down to the twentieth of an inch, can be procured in Paris, at M. Camu's, a la Gouge Anglaise, 58, Rue Sedaine.

Finally, all the cuts must be made quite clean and with the sharpest tools, and the ground may be punched with a fine-toothed punch. The whole of the carved parts may be touched over with an amalgam of yellow wax and turpentine—one ounce of wax and five ounces of turpentine—the wax to be melted in a pot, and the turpentine poured on;

take it off the fire first, or the turps may blaze up; stir it vigorously, then put into a bottle, and shake it up; it must be put on thin with a camel-hair brush, and rubbed in vigorously with a hard-bristle brush.

The safest plan for making this wax varnish is to shave the wax thin, and put it into a bottle with the spirits of tur-

Lid of box.

pentine. Let it stand twenty-four hours, and then shake it well; repeat this two or three times, the result will be a saturated solution of bee's-wax.

These designs are for the lid, front, and sides of a box, and I advise my readers to try and carve them as soon as

they shall have acquired some skill with their tools. The designs are worth any trouble that may be bestowed on them, both for their intrinsic elegance, and for the great increase of knowledge the amateur will acquire who successfully carves them; indeed, the very attempt will increase his knowledge immensely, and add to his skill of hand.

The box should be ten inches long, six and three-eighths width, four and six-eighths deep, outside measurement.

Front of box.

The lid for carving should be nine and a-half inches long by six wide, and should be let into an ogee moulding, to project beyond the box three-eighths of an inch all round.

This moulding should be made with a rebate on the inside. When this moulding is put together, the lid to be carved is dropped into it, and rests on the rebate.

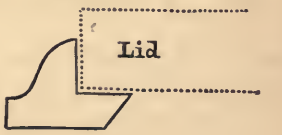
The rebate carries the hinges of the box and the hasp of the lock.

The box to be carved should be made with a mitre dovetail, and fitted, but not glued, together, so that the pieces may be put separately on the table for carving. The thickness of the wood should be five-eighths, and the carving should be half that depth.

End of box.

The carving on the lid should leave a margin all round of three-sixteenths of an inch, and this margin should be carved into pearls when the design is finished. For the method of carving pearls, see Chapter IX. The design for the front and ends should not come nearer the end than six-eighths of an inch, or the mitre dovetail may be cut into.

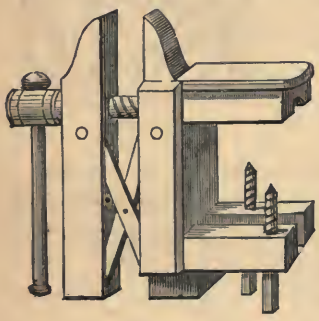
To assist my readers in carving the design for the lid, I have marked with an o where the carving is deep, and with an x where the wood should be left high. The little side ornaments at A and B splay outwards and incline downwards to meet the centre one, which is there quite low and hollow. The base of the design which on each side ends in a volute, is carried low down, and then rises again into the volute.



The little ornamental cuts are done by small, half-round gouges, two cuts each back to back, and the pieces between the ends of cuts, top and bottom, are taken out by a small skew chisel.

Finally, when the front and ends are carved, the amateur should run a narrow bead all round. He may also run a beading round the bottom of the ogee moulding of the lid. The method of making this beading is explained in Chapter VI.

The amateur will frequently be at a loss for a method of holding or fixing small articles to be carved that, from their shape, cannot be put on the bench and held down by holdfast or screw. For articles of this nature, carvers make use of a wooden vice, called "carver's chaps," which they fix into their bench. The French form is the best, and I give an illustration of it. A piece of cork should be glued on the inside of each chap, or jaw, and a stout piece of leather over the cork; these prevent the article to be held from slipping, or from being injured by the pressure of the chaps.



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